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ABSTRACT

This individualized, competency-based study guide is designed to assist teacher-coordinators supervising cooperative education programs for bricklayer's helpers in providing students with general information for immediate reinforcement on the job and developing an understanding of the job prior to employment. A progress chart is provided to allow the instructor to pinpoint student progress. Contents include study guide objectives, suggested teaching procedures for the coordinator, answers to assignment sheets, answers to test, 9 information sheets, and 10 assignment sheets. Topics covered are introduction to bricklaying, safety on the job, masonry tools, materials, mortar preparation, wall construction, cleanup, cleaning block, and mortar joint repair. A seven-part test is provided at the end of the study guide. (YLB)

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INDIVIDUALIZED STUDY GUIDE

ED258021

BRICKLAYER'S HELPER

Coordinator's Guide

Prepared by
Bill Barnes, Ph.D.

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BRICKLAYER'S HELPER

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FOREWORD

This individualized competency-based study guide has been developed for the coop student who is employed or desires to be employed as a bricklayer's helper. This study guide is designed to provide the student with general information prior to employment or provide classroom instruction to reinforce the job training experiences.

Even though these study guides are individualized, the coordinator should closely supervise each student's studies. To allow the coordinator to better direct the learning activities, both coordinator guides and student manuals are available. A progress chart provided in each student manual will allow the coordinator to pinpoint the progress a student has made toward each objective in the sequence in which they are completed.

Special acknowledgments for contributions of review and recommendations are extended to the following individuals who contributed their personal time for the review of this document.

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Bill Barnes, Ph.D., Director
Occupational Curriculum Laboratory

Progress Chart for

BRICKLAYER'S HELPER

Name _____

School _____

		Date Completed
INFORMATION SHEET 1	INTRODUCTION TO BRICKLAYING	
ASSIGNMENT SHEET 1	DEVELOP A JOB PROFILE	
ASSIGNMENT SHEET 2	IDENTIFY PERSONNEL	
TEST	Part 1	
OBJECTIVE	Identify tne types of jobs, nature of work, point out the correct safety factors on the job, and explain the terms associated with bricklaying.	
INFORMATION SHEET 2	SAFETY ON THE JOB	
ASSIGNMENT SHEET 3	DEVELOP A SAFETY IDEA	
ASSIGNMENT SHEET 4	IDENTIFY HANDTOOL DANGERS	
TEST	Part 2	
OBJECTIVE	Point out the correct safety factors on the job.	
INFORMATION SHEET 3	MASONRY TOOLS	
ASSIGNMENT SHEET 5	IDENTIFY MASONRY HAND TOOLS	
TEST	Part 3	
OBJECTIVE	Identify the tools used in masonry construction.	
INFORMATION SHEET 4	MATERIALS	
ASSIGNMENT SHEET 6	SURVEY OF MASONRY MATERIALS	
ASSIGNMENT SHEET 7	IDENTIFY MASONRY MATERIALS	
TEST	Part 4	
OBJECTIVE	Identify the materials and associated terms used in masonry construction.	

INFORMATION SHEET 5	MORTAR PREPARATION	
ASSIGNMENT SHEET 8	MORTAR PREPARATION	
TEST	Part 5	
OBJECTIVE	Identify the types of mortar and the method of preparation.	
INFORMATION SHEET 6	WALL CONSTRUCTION	
ASSIGNMENT SHEET 9	WALL IDENTIFICATION	
TEST	Part 6	
OBJECTIVE	Identify the joints, positions, courses, and types of brick bonds.	
INFORMATION SHEET 7	CLEANUP	
ASSIGNMENT SHEET 10	CLEANING MASONRY	
OBJECTIVE	Identify the methods of clean-up of finished masonry.	
INFORMATION SHEET 8	CLEANING BLOCK	
OBJECTIVE	Identify the methods of organizing equipment for a job.	
INFORMATION SHEET 9	MORTAR JOINT REPAIR	
TEST	Part 7	
OBJECTIVE	Identify the correct method of setting up scaffolding.	

BRICKLAYER'S HELPER

SUGGESTED TEACHING PROCEDURES FOR THE COORDINATOR

I. Objective sheet

A. Discuss each objective with the students.

B. Explain the relationship of each objective to each student's training station.

C. Have the students complete the objectives in the most logical sequence for the training station.

(NOTE: A change of sequence is necessary only if a student changes jobs during the year or if an employer requests training in a specific area.)

D. Add any objectives necessary for the training station.

II. Answers to assignment sheets

A. Some of the assignment sheets will vary according to training and should be graded individually.

B. Some assignment sheets will not have specific answers but will depend on student participation.

III. Answers to unit test

A. Answers are based on total information covered in the unit.

B. For convenience of grading, make corresponding answer sheets for additional test parts added.

IV. Information and corresponding assignment sheets

A. INFORMATION SHEET 1--INTRODUCTION TO BRICKLAYING

1. Have the student review the Information Sheet and then discuss the types of jobs and employment associated with bricklaying.

2. Use ASSIGNMENT SHEET 1--DEVELOP A JOB PROFILE to reinforce the understanding of the job of bricklayer's helper.

(NOTE: Have the student use the library to find additional information on bricklaying. The Dictionary of Occupational Titles is recommended.)

3. Have the student's employer, if the student is employed, assist with the job profile.

4. Use ASSIGNMENT SHEET 2--IDENTIFY PERSONNEL as an in-class assignment.

(NOTE: Job titles may differ in parts of the country or size of job.)

5. Give TEST PART 1 to determine if the student has reached level of understanding.

B. INFORMATION SHEET 2--SAFETY ON THE JOB

1. Have the student review the Information Sheet and then discuss the importance of work safety. Use TMs 1-6 for discussion topics.

2. Use ASSIGNMENT SHEET 3--DEVELOP A SAFETY IDEA to reinforce this area of instruction.

3. Display the students' posters in the classroom or at the place of employment.

4. Use ASSIGNMENT SHEET 4--IDENTIFY HANDTOOL DANGERS to emphasize the dangers of using tools incorrectly.

5. Give TEST PART 2 to evaluate the student,s understanding of safety.

C. INFORMATION SHEET 3--MASONRY TOOLS

1. Have the student review the Information Sheet and discuss the following with the student:

   a. Laying tools

   b. Finishing tools

   c. Power equipment

2. Use ASSIGNMENT SHEET 5--IDENTIFY MASONRY HAND TOOLS to reinforce the identification of hand tools.

3. Use TM-8 to discuss proper use of scaffolds.

4. Give TEST PART 3 to evaluate student understanding.

D. INFORMATION SHEET 4--MATERIALS

1. Have the student review the Information Sheet and then discuss it with the student.

2. Have the student use ASSIGNMENT SHEET 6--SURVEY OF MASONRY MATERIALS as an exercise to support the learning process.

3. Use ASSIGNMENT SHEET 7--IDENTIFY MASONRY MATERIALS as a classroom reinforcement.

4. Give TEST PART 4 as a means of evaluating student achievement.

E. INFORMATION SHEET 5--MORTAR PREPARATION

1. Have the student review the Information Sheet and TMs 13 and 14.
2. Use ASSIGNMENT SHEET 8--MORTAR PREPARATION to emphasize the steps in preparing mortar and the types of mortar.

3. Give TEST PART 5 to evaluate the student's knowledge of mortar.

F. INFORMATION SHEET 6--WALL CONSTRUCTION

1. Have the student review the Information Sheet and identify types of joints, finishes, positions, and courses. Use TMs 15 and 16 to illustrate.

2. Use ASSIGNMENT SHEET 9--WALL IDENTIFICATION to reinforce the correct names of brick used in wall construction. This could be repeated on different buildings.

3. Give TEST PART 6 to evaluate the student's understanding.

G. INFORMATION SHEET 7--CLEAN UP

1. Have the student review the Information Sheet to develop an understanding of the reasons for cleanup.

2. Use ASSIGNMENT SHEET 10--CLEANING MASONRY to reinforce the student's understanding of the process.

H. INFORMATION SHEET 8--CLEANING BLOCK--Have the student review the Information Sheet to understand the difference between brick and block.

I. INFORMATION SHEET 9--MORTAR JOINT REPAIR

1. Have the student review the process for repair of mortar joints since it will come up at some time in the future.

2. Use TEST PART 7 to evaluate student comprehension of INFORMATION SHEETS 7-9.

V. Transparency Masters

(NOTE: Transparencies are provided in the student's manual as Information Sheets.)

A. TM-1--DEVELOP A SAFETY ATTITUDE

B. TM-2--KEEP HAND TOOLS IN PLACE

C. TM-3--BE SURE SCAFFOLDS ARE SECURE

D. TM-4--KEEP YOUR HANDS AWAY FROM TURNING MIXER

E. TM-5--CLEAN UP SPILLED GASOLINE

F. TM-6--KEEP A FIRM GRIP

G. TM-7--WHEELBARROWS

H. TM-8--SCAFFOLDS

I. TM-9--MODULAR BRICK SHAPES

J. TM-10--MODULAR BRICK SIZES

K. TM-11--TYPES OF CONCRETE BLOCKS

L. TM-12--DESIGNER CORE BLOCKS

M. TM-13--ABOVE GRADE--BELOW GRADE

N. TM-14--METHODS OF MIXING MORTAR

O. TM-15--KINDS OF BRICK BONDS

P. TM-16--TYPICAL WALL SECTION

VI. UNIT TEST

A. The unit test is divided into seven parts. Use the checklist to determine which part corresponds to each Information Sheet.

B. Various approaches may be used in testing.

1. Each part of the test may be given as the student reviews the information from each Information Sheet.

2. Test sheets may be pulled from the student manual and given to the student upon completion of ASSIGNMENT SHEETS.

3. Parts of the test could be used as a pretest to determine if the student needs to use the guide.

4. Some coordinators may wish to use the test as additional assignments to reinforce the Information Sheets.

C. Add test questions to cover any material you add to the guide.

VII. References:

A. Barnes, Bill. Building Maintenance--Masonry. Commerce, TX: Occupational Curriculum Laboratory, 1983.

B. Dalzell, Ralph J., and Gilbert Townsend. Masonry Simplified. Chicago: American Technical Society, 1970.

C. Kicklighter, Clois E. Modern Masonry. South Hollond, IL: Goodheart-Wilcox Co., Inc., 1977.

D. Krek, Sr., R. T. Masonry Skills. Albany, NY: Delmar Publishers, 1976.

BRICKLAYER'S HELPER

ANSWERS TO ASSIGNMENTS

Assignment Sheet 1

1. Bricklayer
2. Brickmason
3. Stonemason
4. Tile setter
5. Mason helper
6. Construction helpers
7. Mason tender
8. Hod carrier

Assignment Sheet 2

1. Mason tender (preferred) or mortar tender
2. Mason (bricklayer)
3. Mason tender (bricklayer's helper)
4. Hod carrier

Assignment Sheet 3

Evaluated to the satisfaction of the coordinator.

Assignment Sheet 4

Evaluated to the satisfaction of the coordinator.

Assignment Sheet 5

1. Trowel
2. Mortar hoe
3. Brick tongs
4. Brick chisel
5. Mortar box
6. Brush brick
7. Brick hammer
8. Acid brush
9. Rubber gloves
10. Spacing ruler

Assignment Sheet 6

The survey of masonry materials should be checked by the coordinator.

Assignment Sheet 7

A. Designer block
B. Flagstone
C. Rubble stone
D. Cut stone
E. Concrete block
F. Brick

Assignment Sheet 8

1. a. Determine amount needed
   b. Place 1/2 amount sand in mortar box
   c. Add mortar mix
   d. Add remaining sand
   e. Mix sand and mortar mix
   f. Move to one end of mortar box

ANSWERS TO ASSIGNMENTS

g. Add water
h. Cut the dry mix into the water
i. Mix and add water to proper consistency

2.

Type	Portland Cement	Hydrated Lime	Sand
M	1	1/4	2 1/2 to 3 times the total amount of cement and lime
S	1	1/4 to 1/2	
N	1	1/2 to 1 1/4	
O	1	1 1/4 to 1 1/2	
K	1	2 1/2 to 4	

Assignment Sheet 9

Answers must be determined from drawing.

Assignment Sheet 10

I. 1. C
2. B
3. A

II. 1. Dry clean the area
2. Pre soak
3. Prepare acid solution
4. Apply Acid
5. Scrub the area
6. Flush with water

BRICKLAYER,S HELPER

ANSWERS TO TEST

PART 1

A.
1. e
2. b
3. a
4. c
5. d

B.
1. T
2. T
3. F
4. T
5. T
6. T
7. F
8. T
9. T
10. T

PART 2

1. A
2. B
3. A
4. C
5. C
6. B
7. A
8. B
9. A

PART 3

A.
1. laying
2. laying
3. laying
4. laying
5. finishing
6. finishing
7. laying
8. laying
9. finishing
10. laying
11. finishing
12. finishing

ANSWERS TO TEST

B.
- ✓ 1.
- ✓ 2.
- ✓ 3.
- 4.
- ✓ 5.
- ✓ 6.
- ✓ 7.
- ✓ 8.
- 9.
- ✓ 10.

C. a. Masonry saw
b. Mortar mixer

PART 4

A.
- 4 a.
- 3 b.
- 6 c.
- 1 d.
- 2 e.
- 5 f.

C.
- ✓ 1.
- ✓ 2.
- 3.
- ✓ 4.
- ✓ 5.

B. 1. face
2. common
3. fire

D. 1. Flagstone
2. Cut stone
3. Rubble stone

PART 5

A.
- 4 a.
- 1 b.
- 2 c.
- 6 d.
- 3 e.
- 5 f.
- 8 g.
- 7 h.
- 9 i.

B.
- ✓ 1.
- ✓ 2.
- 3.
- ✓ 4.
- ✓ 5.
- ✓ 6.

C. 1.
3.
4.
5.
7.
8.

PART 6

A.
- 6 a.
- 3 b.
- 1 c.
- 4 d.
- 2 e.
- 5 f.

B. 1. Bed
2. Head
3. Closure

C.
- ✓ a.
- ✓ 2.
- 3.
- ✓ 4.
- ✓ 5.

D. 1. Soldier
2. Rowlock stretcher
3. Header
4. Rowlock
5. Stretcher
6. Sailor

E.
- ✓ 1.
- ✓ 2.
- ✓ 3.
- 4.
- ✓ 5.
- 6.

F. 1. Flemish
2. English
3. Stack
4. American

G. 1. Straight
2. Decorative

H. ✓ 1.
___ 2.
✓ 3.
✓ 4.

I. ✓ 1.
___ 2.
___ 3.

PART 7

A.
A. 3
B. 5
C. 8
D. 2
E. 7
F. 1
G. 4
H. 6

B.
1. T
2. T
3. T
4. F
5. F
6. T
7. T
8. F
9. T
10. T

ANSWERS TO TEST

BRICKLAYERS HELPER

STUDY GUIDE OBJECTIVES

After completing this study guide, the student will be able to identify the types of jobs and activities associated with bricklaying-related jobs. This knowledge will be evidenced by demonstration and by satisfactorily completing the study guide test.

SPECIFIC OBJECTIVES

After completing this study guide, the student will be able to:

1. Identify the types of jobs, nature of work, and definition of terms associated with bricklaying
2. Point out the correct safety factors on the job
3. Identify the tools used in masonry construction
4. Identify the materials and associated terms used in masonry construction
5. Identify the types of mortar and the method of preparation
6. Identify the joints, positions, courses, and types of brick bonds
7. Identify the methods of clean-up of finished masonry
8. Identify the methods of organizing equipment for a job
9. Identify the correct method of setting up scaffolding

BRICKLAYERS'S HELPER

INFORMATION SHEET 1--INTRODUCTION TO BRICKLAYING

I. Bricklayers

A. Bricklayers are skilled workers who build walls, partitions, fireplaces, chimneys, and other structures with brick or block.

B. Bricklayers' helpers provide bricklayers with assistance in construction.

C. Helpers often learn the trade and move into apprenticeship or other training programs.

D. This job offers opportunities that allow for specialization in one area of masonry. Other masonry helpers may do a number of jobs on a construction site such as building forms, finishing concrete, or moving brick or block.

II. Nature of Work

A. Work is normally outside.

B. It requires good physical condition.

C. Helpers often move brick and mortar to the site for the bricklayers.

D. Work may require working on and carrying of ladders and scaffolds.

E. Work may be seasonal and hours determined by weather conditions.

F. Helpers may be employed by individual bricklayers or by companies, depending on the job.

G. Work is sometimes strenuous and involves moderately heavy lifting.

H. Helpers are on their feet for prolonged periods of time with much stooping and lifting.

III. Related Occupations

A. Bricklayers' helpers usually work with brickmasons or stone masons. The correct title is mason tender.

B. Stonemasons lay stone rather than brick or block.

C. Tile setters hire helpers, and that job is similar to that of the bricklayer's helper.

D. Masonry helpers often work with concrete and brick on the same job.

E. Often, construction helpers are assigned to help as masonry or bricklayer's helpers as the construction job progresses.

IV. Training Requirements

A. Helpers are usually hired with little or no experience.

B. Knowledge of terms and tools is helpful.

C. Training usually takes place on the job.

V. Terms and Definitions

A. Bearing wall--a wall which supports a load other than its own weight

B. Bond--the tying together of a masonry wall by use of mortar, metal ties, etc.

C. Bricklayer--a skilled worker who builds walls and other structures with brick

D. Cement--a burned mixture of crushed clay and limestone used for making mortar or concrete

E. Glazed tile--tile that has a glasslike surface

F. Hod carrier--individual who moves mortar and brick to the bricklayer

G. Lime--a caustic material used in making mortar mix which provides the elastic quality; made by burning limestone

H. Mason--a worker skilled in working with bricks, blocks, stone, etc.

I. Masonry--a term which refers to anything made of stone, concrete, brick, tile, etc.

J. Mortar mix--a material containing lime and cement which is used to bond masonry

K. Paving--the process of forming a floor using brick, stone, or tile

L. Tender--a person who takes care of the needs of masons; a hod carrier, wheelbarrow handler, etc.

BRICKLAYER'S HELPER

ASSIGNMENT SHEET 1--DEVELOP A JOB PROFILE

Directions: On a sheet of paper, list the related occupations and the jobs which a bricklayer's helper would do. Discuss with your coordinator or a bricklayer.

BRICKLAYER'S HELPER

ASSIGNMENT SHEET 2--IDENTIFY PERSONNEL

Directions: Write the name or names of the job titles next to the correct person in the picture.

Mason	Bricklayer
Hod carrier	Foreman
Mason tender	Mortar tender

ASSIGNMENT

BRICKLAYER'S HELPER

INFORMATION SHEET 2--SAFETY ON THE JOB

I. Masonry hand tool safety

A. Be aware of sharp edges on hand tools such as trowels, hoes, and shovels.

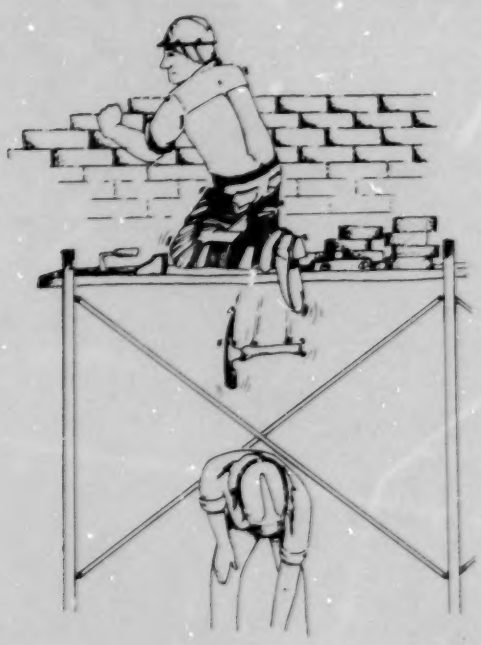
B. Remember that brick hammers are made of hardened steel and can shatter (See TM-1).

(NOTE: Safety glasses should be worn when cutting or breaking brick or block.)

C. Striking tools with hardened surfaces against other hardened surfaces will cause damage.

D. Replace all hand tools in the proper place after use (See TM-2).

E. Be careful and avoid dropping hand tools from scaffolds.



II. Equipment Safety

A. Mortar stand

1. Should be placed within easy reach of the mason

2. Should be set up so it is level and steady

3. Should be correctly loaded to prevent overloading on an edge or an end, which can cause the stand to fall

B. Scaffolds (See TM-3)

1. Should be strong enough to safely hold the worker, mortar, and bricks

2. Should be secured to prevent tipping over

3. Should be loaded correctly to prevent overloading on an edge or at the end

4. Should be on footings to prevent tipping

C. Wheelbarrow

1. Helps prevent back strain when used to move heavy loads

2. Tips over easily if overfilled

(NOTE: Use of wheelbarrows or ramps can be dangerous)

III. Personal safety equipment

A. Hard hat--protects head; should <u>always</u> be worn when doing masonry work

B. Steel-toed shoes--protects feet from injury caused by dropping hard objects

C. Safety glasses--protects eyes; should be worn when using a masonry saw or when breaking brick or block

D. Rubber gloves--protects hands from acid burns when using acid to clean brick

IV. Power equipment safety

A. Masonry saw

1. Always wear eye protection when using a dry masonry saw.

2. Keep hands away from blade while power is connected.

3. Check electric cord for frayed or bare wires.

B. Electric mortar mixer (TM-4)

1. <u>NEVER</u> place hands in a turning mixer.

2. DO NOT put a shovel or any other object in a turning mixer.

3. Check electric cord for frayed or bare wires.

4. Stay clear of pulleys, belts, and gears.

C. Gasoline-powered mixer (TM-5)

1. ALWAYS fill gasoline tank while in a open area.

2. DO NOT start the motor if gasoline is spilled on the engine. Wait until gasoline has evaporated.

3. Move gasoline can away from mixer before starting motor.

4. DO NOT put hand or any object in a mixer while it is turning.

5. Stay clear of pulleys, belts, and gears.

D. Power trowel (TM-6)

1. DO NOT tie the switch at the ON position so that it cannot automatically turn OFF.

2. Keep a firm grip on the handles at all times.

3. DO NOT start the motor if gasoline has been spilled. Wait until gasoline has evaporated.

4. Get help when moving the trowel.

5. Keep feet away from blades and moving parts.

V. Job Site Safety

A. Job sites have many pieces of equipment moving around. Stay alert and out of their way. Most pieces of equipment have beepers that sound when they back up.

B. Stay out from under scaffolds or overhead activity unless you must be there (See TM-2).

C. Do not use earphones to listen to music on the job.

D. Loud equipment such as air hammers may require ear protection to prevent hearing loss.

E. Watch where you walk. Items such as brick, boards, and extension cords may be moved during the job.

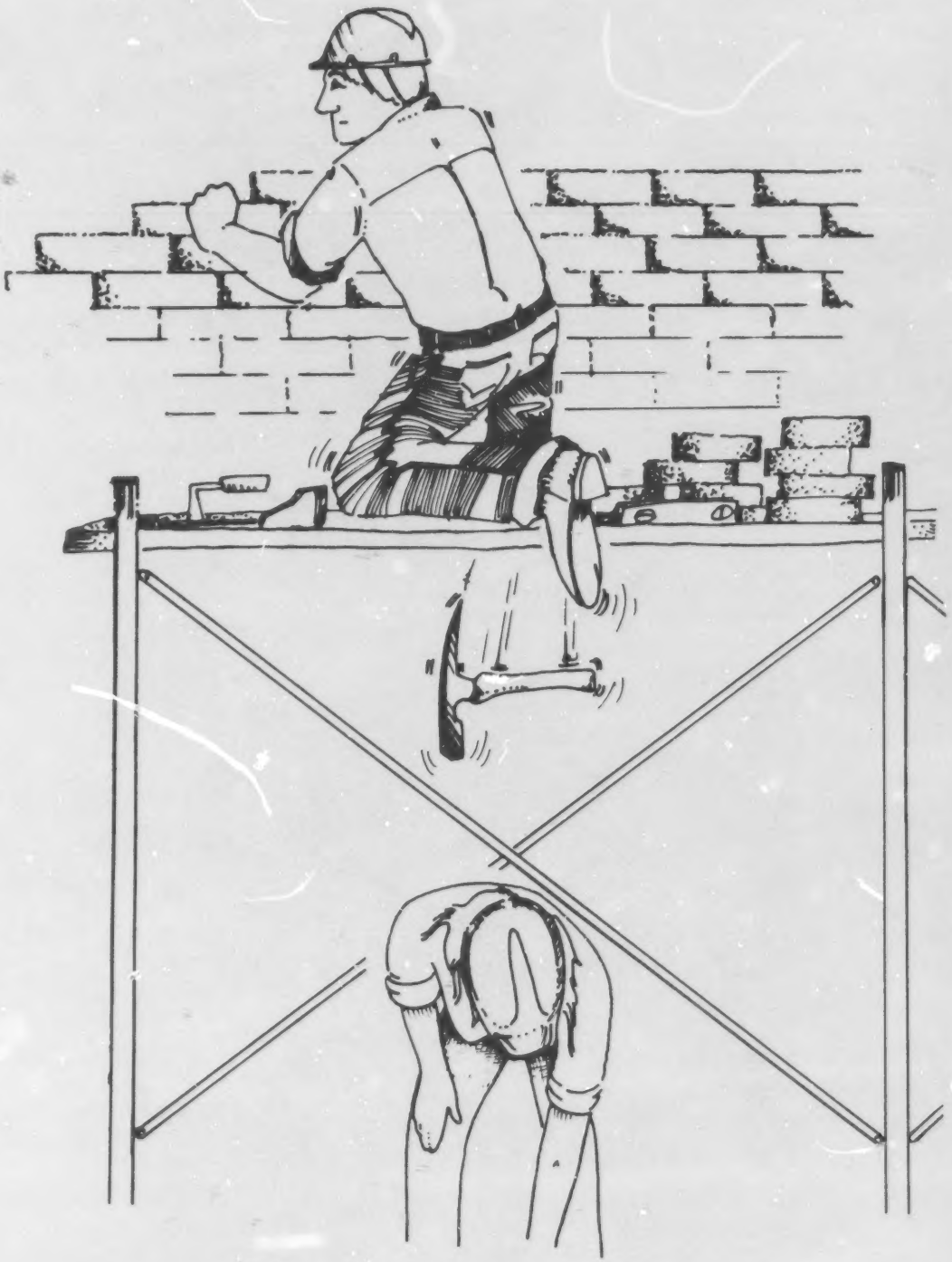
INFORMATION

DEVELOP A SAFETY ATTITUDE

HARDENED STEEL
CAN SHATTER

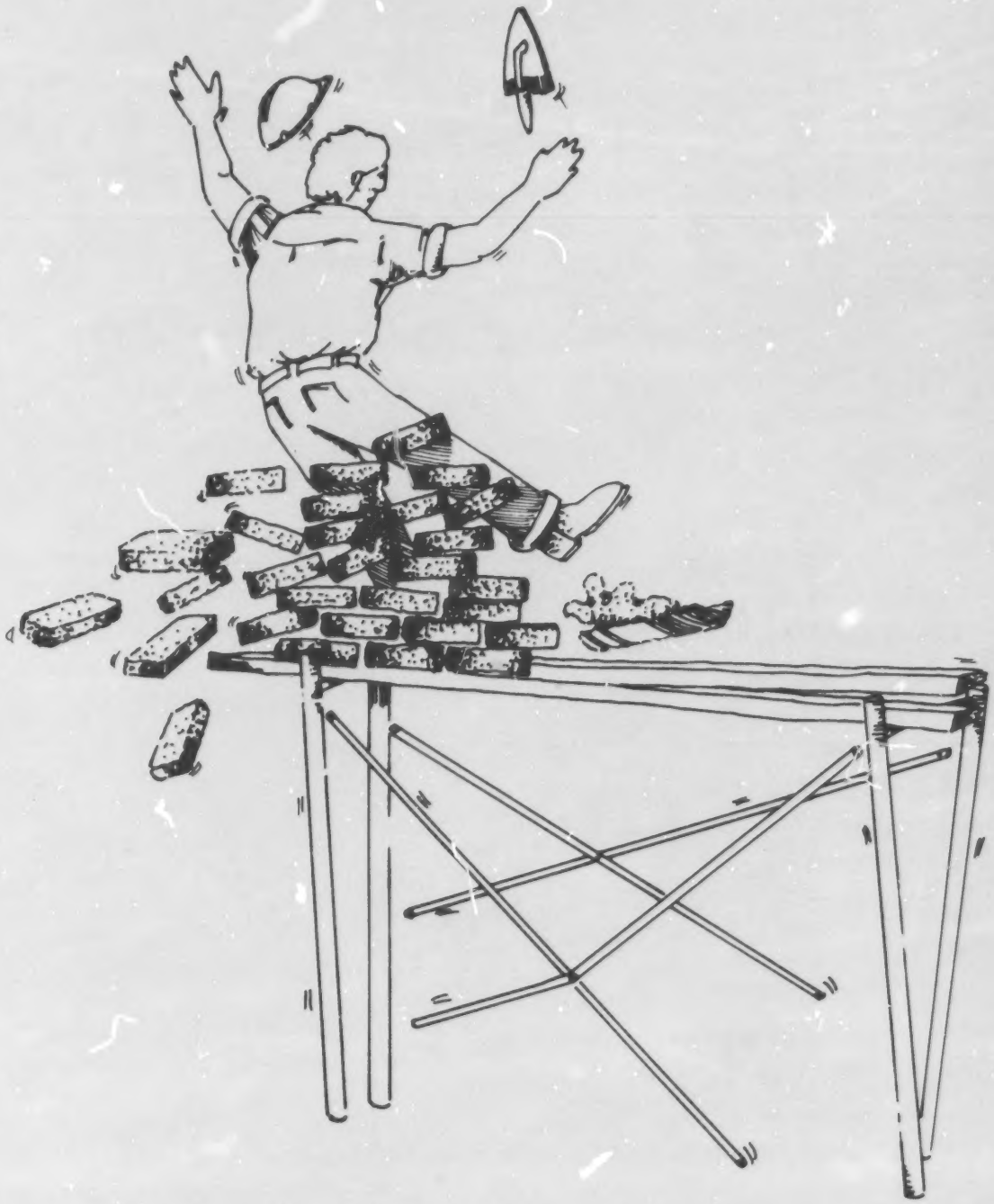
TM-1

KEEP HAND TOOLS IN PLACE



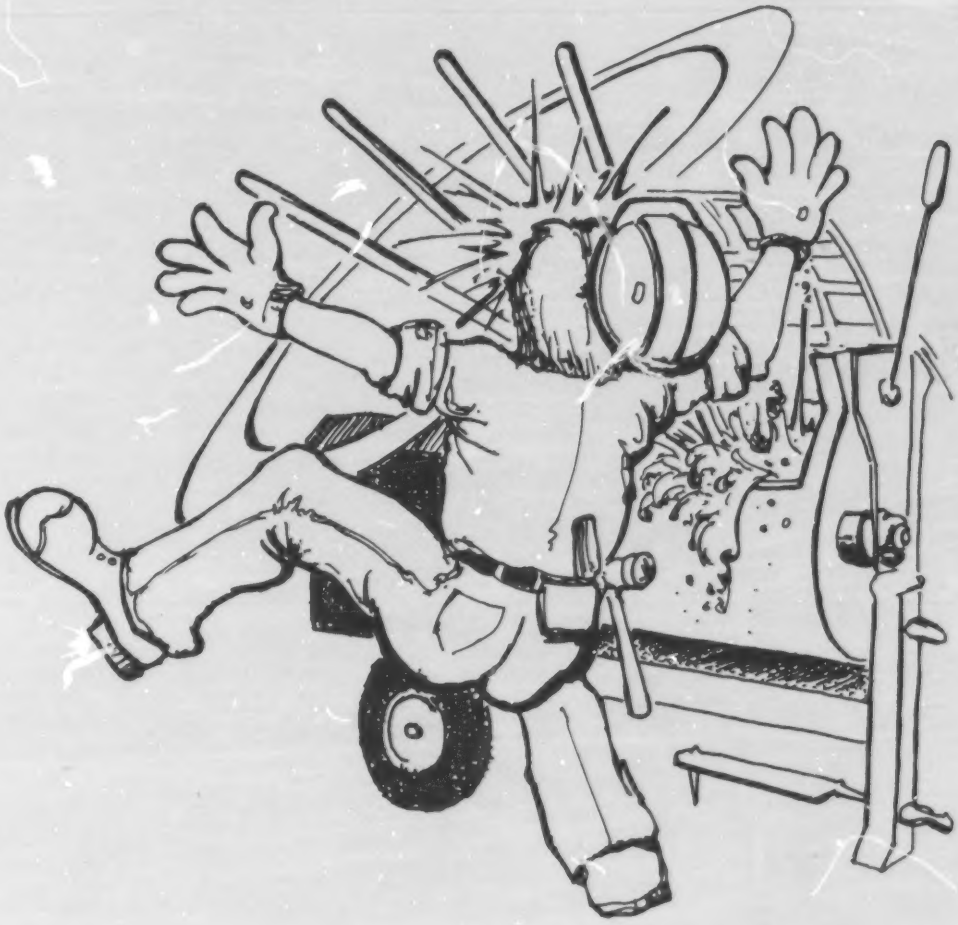
TM-2

BE SURE SCAFFOLDS ARE SECURE



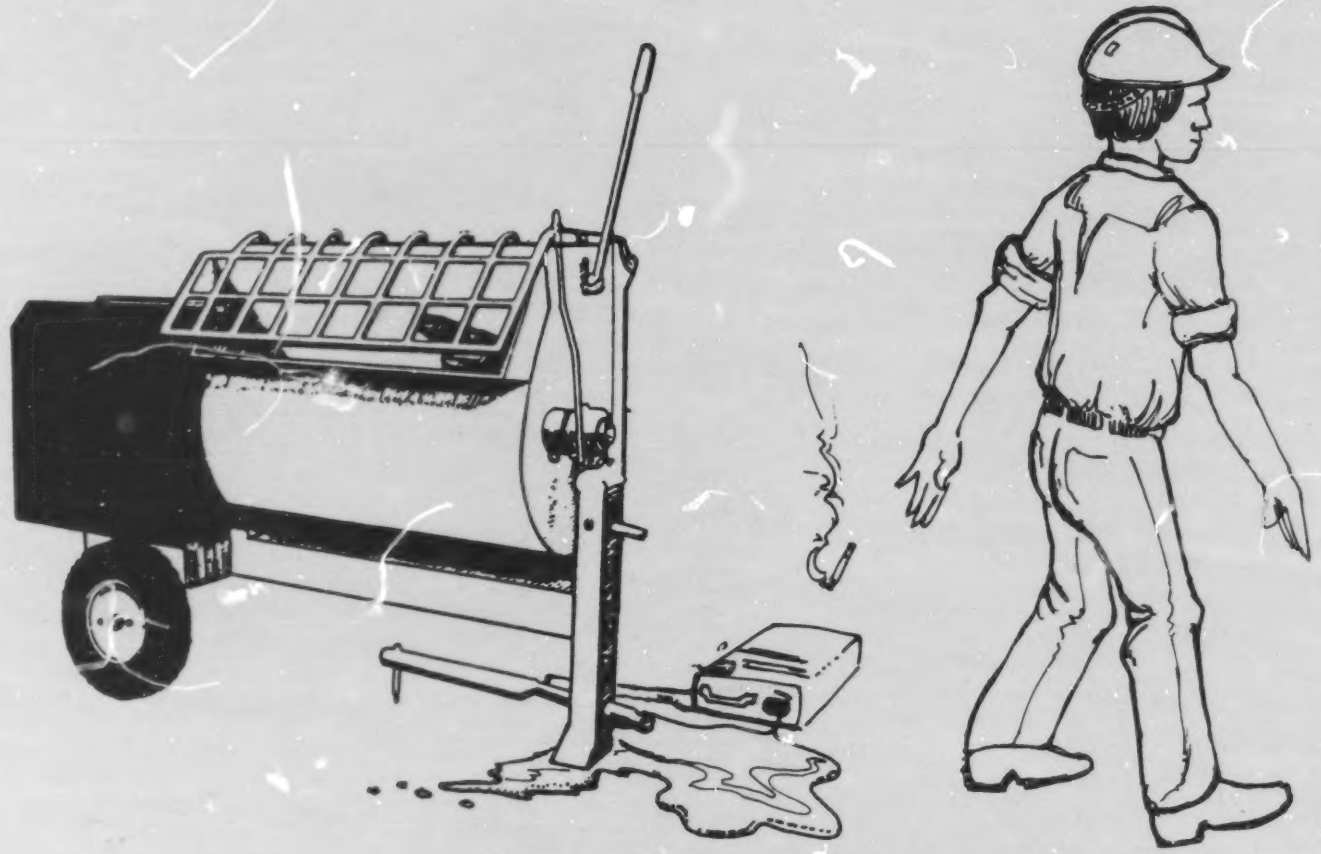
TM-3

KEEP YOUR HANDS AWAY FROM TURNING MIXER



TM-4

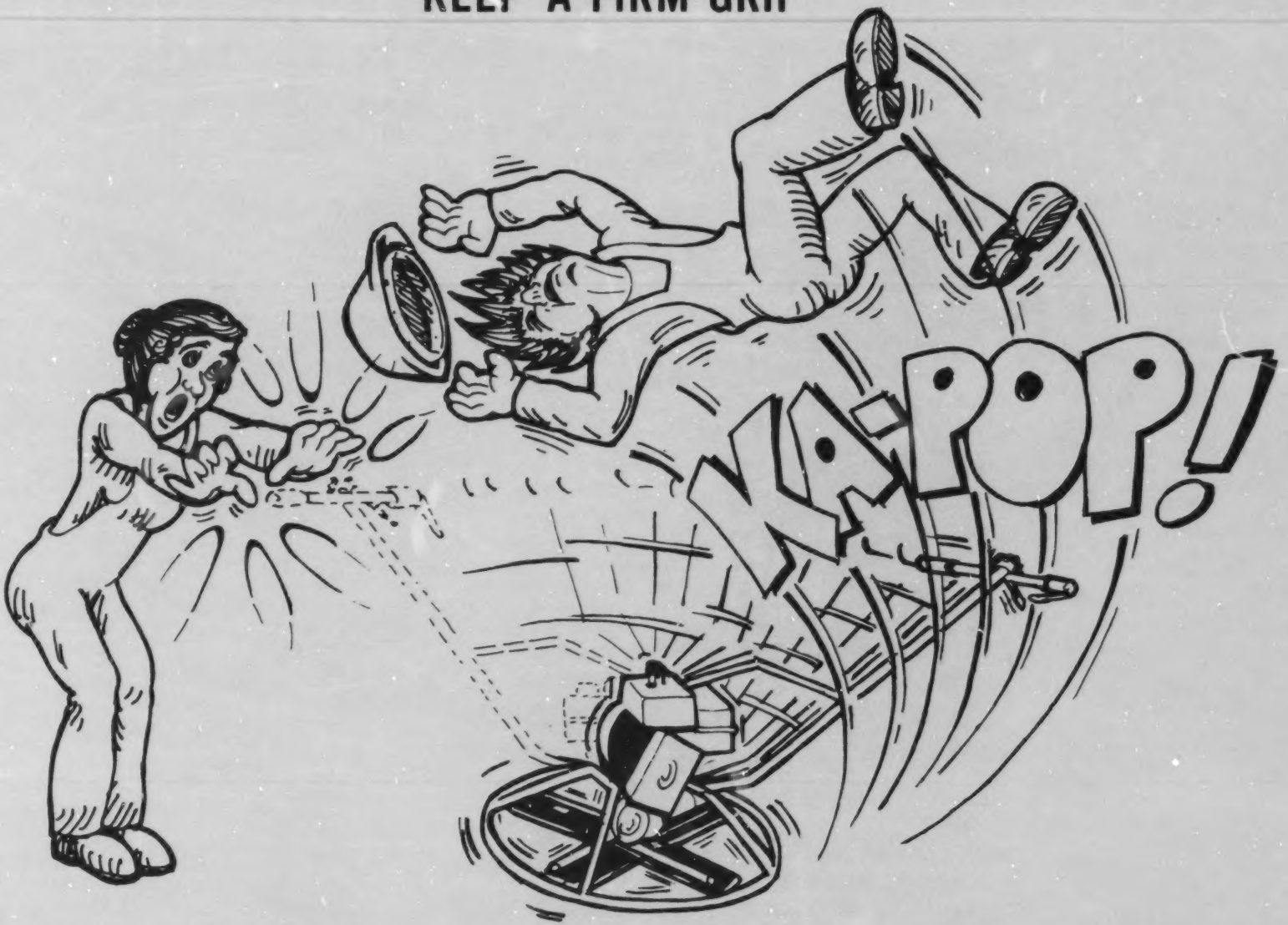
CLEAN UP SPILLED GASOLINE



TM-5

21

KEEP A FIRM GRIP



TM-6

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BRICKLAYER'S HELPER

ASSIGNMENT SHEET 3--DEVELOP A SAFETY IDEA

Directions: On a piece of poster board or sheet of typing paper, prepare a poster about masonry safety. You may want to use some of the safety rules covered in the Information Sheet for ideas in making your poster.

(NOTE: The coordinator or your employer may want to display your poster as a safety reminder.)

ASSIGNMENT

BRICKLAYER'S HELPER

ASSIGNMENT SHEET 4--IDENTIFY HANDTOOL DANGERS

Directions: Write the possible hazards that exist in each situation below. Describe what could happen.

A. A hammer has large chips knocked out of the face.

B. A person is cutting brick without safety glasses.

C. An extension cord going to a mixer is frayed.

D. A trowel is nicked and has sharp burrs.

E. Gasoline is spilled on a hot engine.

F. A gas can is left sitting by the motor on the mixer.

BRICKLAYER'S HELPER

INFORMATION SHEET 3--MASONRY TOOLS

I. Masonry hand tools

A. Laying tools

1. Trowel--a tool used to lay and spread mortar

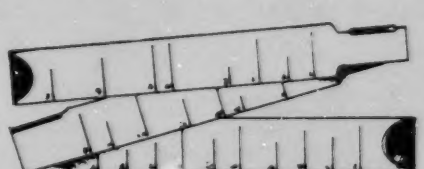
2. Brick chisel--a sharp tool used to cut brick to correct dimensions

(NOTE: Also called mason's chisel.)

3. Brick hammer--a tool used to strike brick chisels and break or chip masonry materials

4. Mason's level--a 42- to 48-inch straightedge tool used to plumb a wall

5. Spacing rule--a folding rule used to determine course height for bricks or blocks



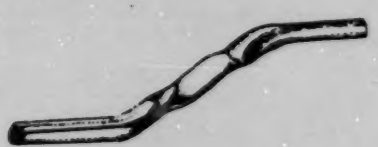
6. Mortar hoe--a long-handled tool used to mix mortar

7. Shovel--a tool used to move masonry materials such as sand and mortar

B. Finishing tools

1. Jointers--used to finish the surface of mortar joints

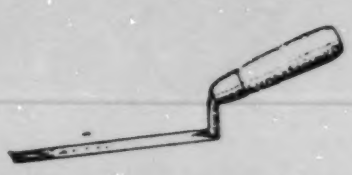
a. Sled runner--used to finish the bed joints



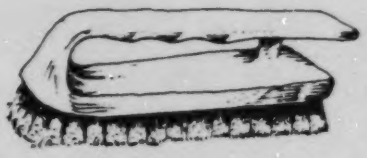
b. S-shaped--used to finish the head joints

2. Joint raker--used to finish the joints just before the mortar hardens

3. Tuck pointer joint filler--used to put fresh mortar in joints that need repair



4. Mason's utility brush--used to brush off excess mortar after jointing



5. Acid brush--used with muriatic acid to remove mortar

6. Brush brick--used to remove dried excess mortar

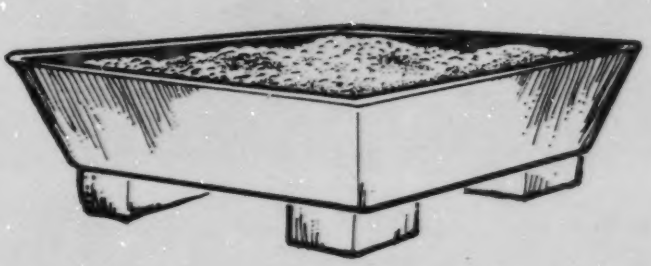
II. Masonry equipment

A. Wheelbarrows (TM-7)

1. Contractor's wheelbarrow--used to move materials such as sand and mortar

2. Wooden wheelbarrow--used to move materials such as concrete blocks and bricks

B. Mortar box--used to hold mortar for mixing

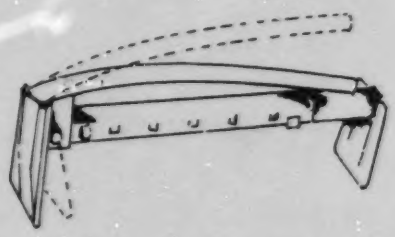


INFORMATION

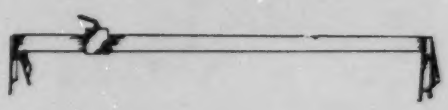
C. Mortar stand--used to hold mortar within easy reach of mason

D. Scaffolds--used to support the mason and materials being used (TM-8)

E. Brick tongs--used to carry several bricks at a time

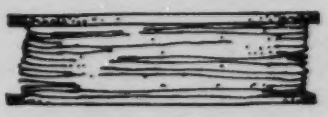


F. Corner poles--used to hold a line for proper spacing of each course of bricks

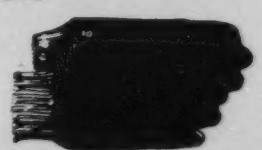


G. Corner blocks--used to hold the mason's line (may be metal or wood)

H. Mason's line--a length of nylon string used to keep courses level and even



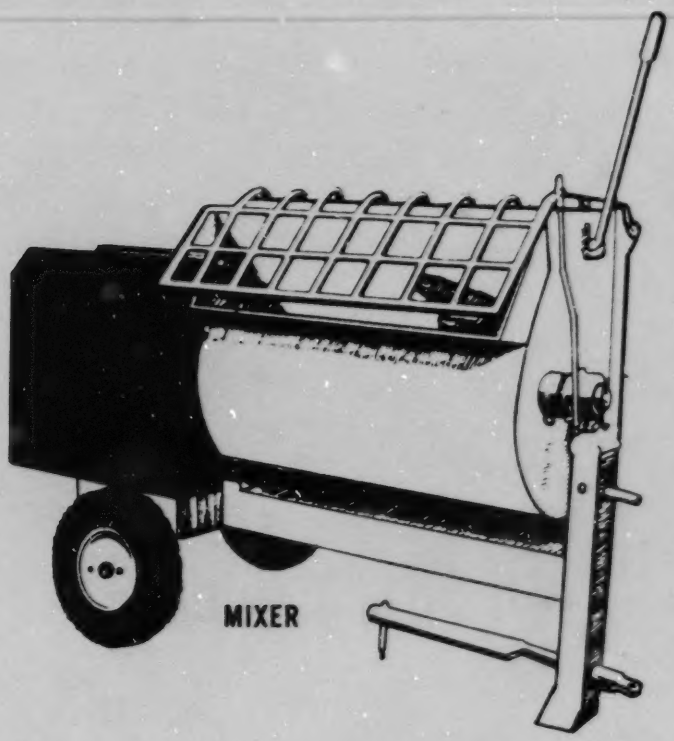
I. Rubber gloves--waterproof gloves that are worn to protect hands when working with muriatic acid



J. Bucket--metal or plastic, used for mixing water and muriatic acid

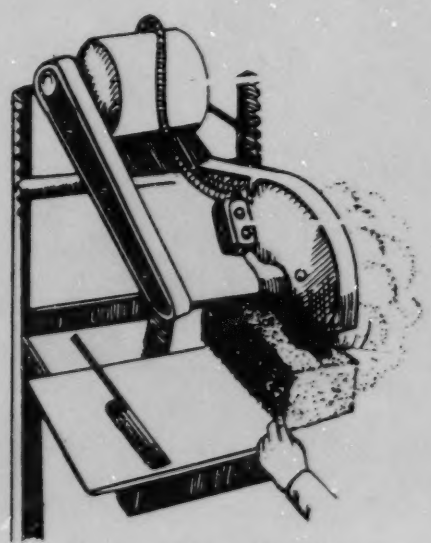
III. Power masonry equipment

A. Mortar mixer--used to mix medium size amounts of mortar



MIXER

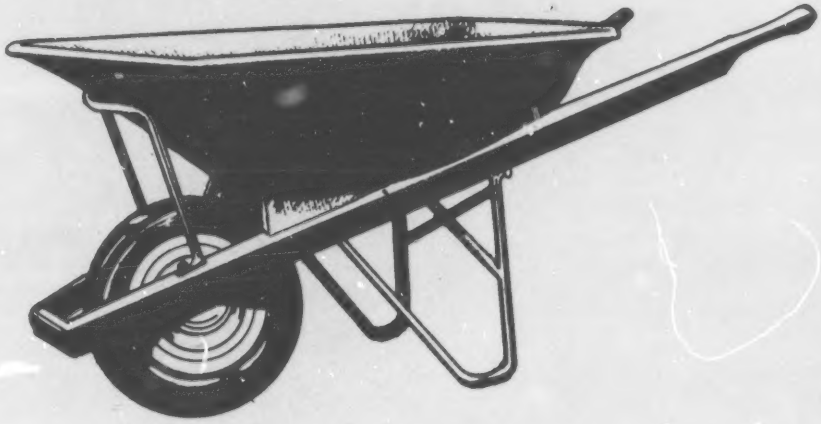
B. Masonry saw--used to cut masonry blocks, brick, and tile



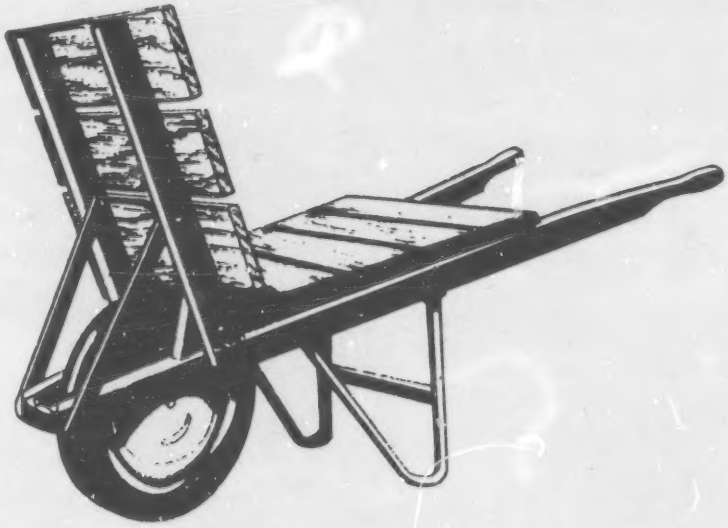
MORTAR SAW

INFORMATION

WHEELBARROWS



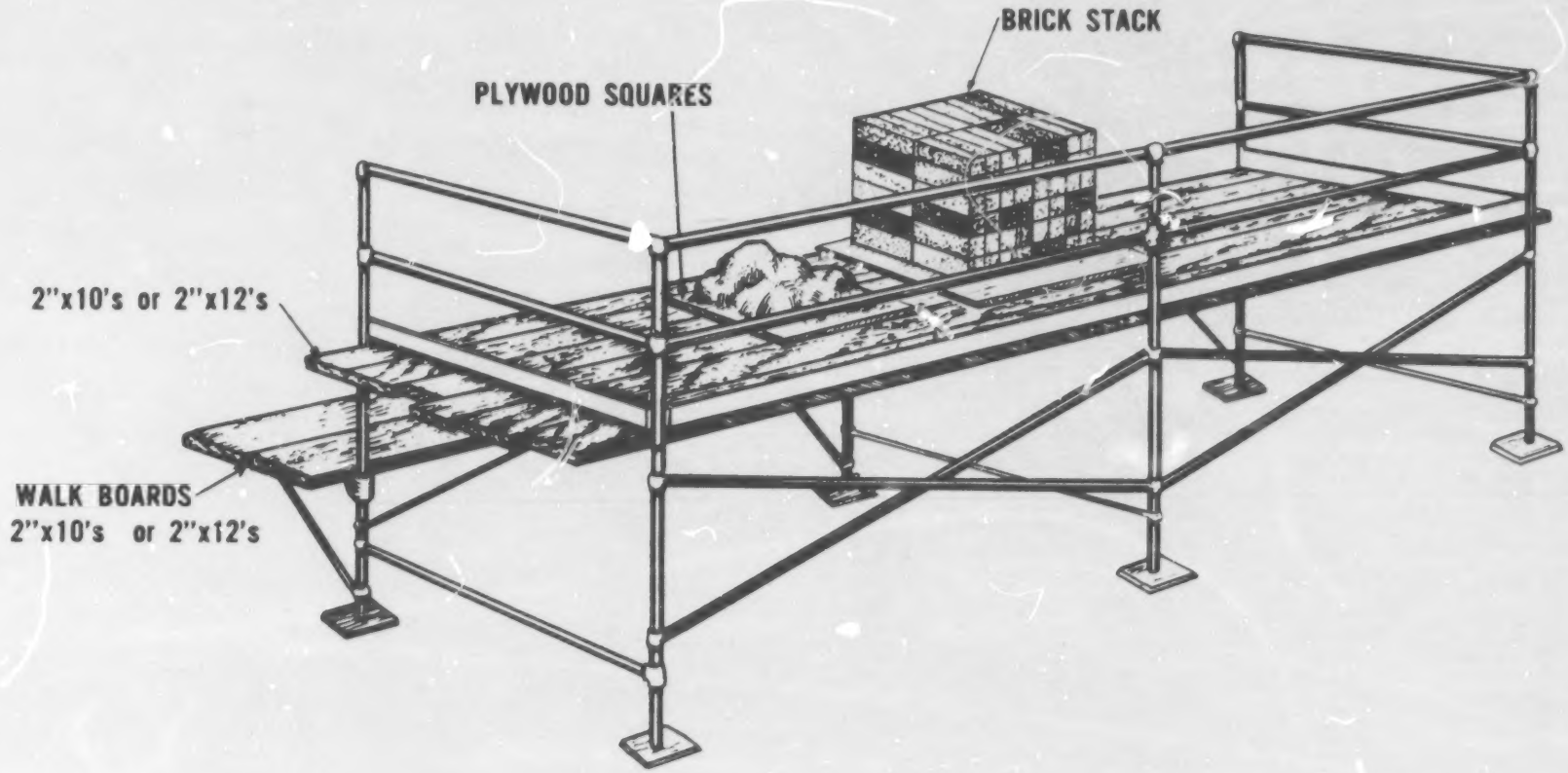
CONTRACTOR'S WHEELBARROW



WOODEN WHEELBARROW

TM-7

SCAFFOLDS



TM-8

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BRICKLAYER'S HELPER

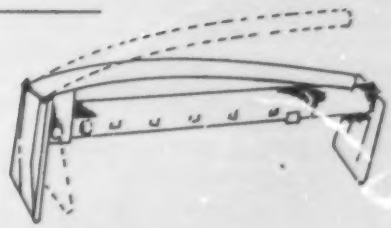
ASSIGNMENT SHEET 5--IDENTIFY MASONRY HAND TOOLS

Directions: Identify each of the following masonry tools by writing the correct name above the illustration.

1. _____

2. _____

3. _____



4. _____

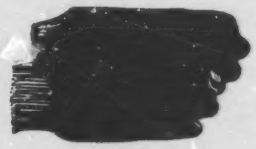
5. _____

6. _____

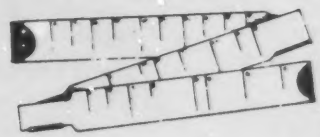
7. _____

8. _____

9. _____



10. _____



ASSIGNMENT

BRICKLAYER'S HELPER

INFORMATION SHEET 4--MATERIALS

I. Terms and definitions

A. Kiln--a large oven used to burn or "fire" bricks

B. Brick--a masonry unit made of clay or shale and fired in a kiln

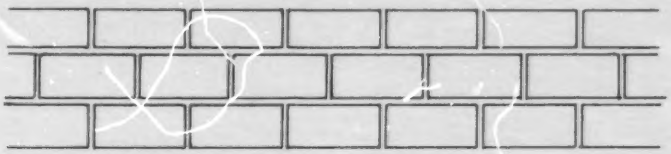
C. Concrete block--a solid or hollow masonry unit made of concrete

D. Nominal--the actual size of a brick plus the thickness of the mortar joint

E. Modular--brick sizes that make estimating the number of bricks needed easier

F. Ceramic--a high gloss finish that is baked on in a kiln

G. Course--a layer of bricks, blocks, or stones in a wall



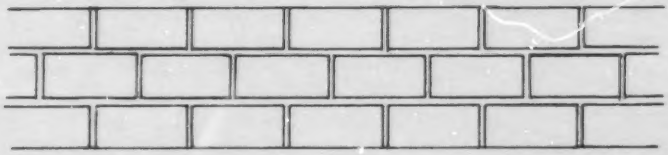
H. Joint--the space filled with mortar between each brick

I. Plumb--means a wall is straight up and down and level

J. Bed joint--the horizontal mortar joint between each layer or course of bricks

K. Head joint--the vertical mortar joint between the ends of each brick

EXAMPLE:



L. Tuck pointing--putting fresh mortar into defective joints

M. Muriatic acid--an acid combined with water and used to remove mortar from masonry

II. Bricks

A. Types

1. Face brick--used for good appearance where a wall will be seen

2. Common brick--used where strength is needed

(NOTE: Common brick is also called building brick.)

3. Fire brick--used in places exposed to high heat, such as fireplaces

B. Sizes and shapes (TM-9 and TM-10)

1. Thickness varies from about 3 to 12 inches.

2. Height varies from about 2 to 8 inches.

3. Length can be up to 16 inches.

4. Most bricks are modular sized.

C. Colors

1. Range from white to yellow in the light colors

2. Range from tan to dark red in the dark colors

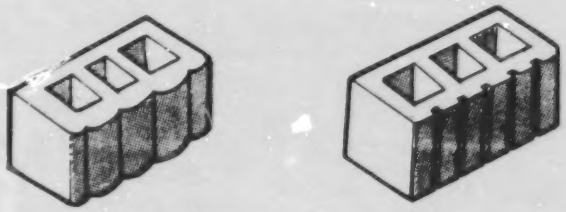
3. Mineral additives are used to change colors before the brick is fired

III. Concrete blocks

A. Types (TM-11)

1. Standard lightweight--used for flat surface walls

2. Textured--design blocks used for decorative walls



3. Glazed face--has ceramic surface that resists water and chemicals

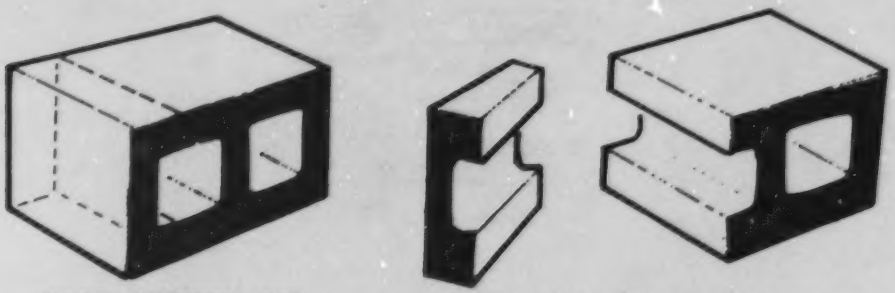
4. Designer core--used for decorative walls that control noise and light (TM-12)

B. Classes of blocks

1. Solid load-bearing

a. Used to support heavy loads, such as roof structures

b. Not more than 25% of cross-sectional area is hollow



CROSS-SECTION CUT LESS THAN 25% IS HOLLOW

2. Hollow load bearing

   a. Used to support most common building loads

   b. 40% to 50% of cross-sectional area is hollow

3. Hollow nonload bearing

   a. Thin-shelled and lightweight

   b. Used in nonload bearing-walls

C. Sizes

BLOCK	MANUFACTURED SIZE			JOINT SIZE	NOMINAL SIZE		
	t	h	l		t	h	l
12 in.	7 5/8	7 5/8	11 5/8	3/8	8	8	12
16 in.	7 5/8	7 5/8	15 5/8	3/8	8	8	16

(NOTE: Thickness can vary from 4 to 12 inches.)

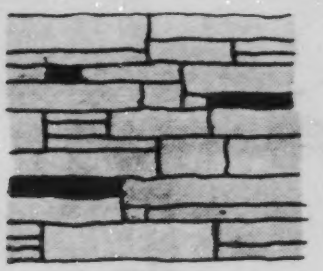
IV. Stone

A. Flagstone

1. Large, flat rock

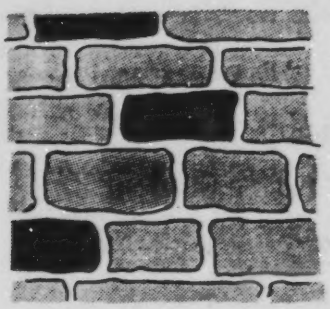
2. Generally 3 to 4 inches thick

3. Laid on edge



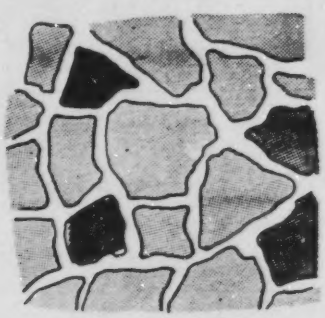
B. Cut stone

1. Large, flat rock
2. Cut to 3 to 4 inches wide
3. Laid with edges exposed

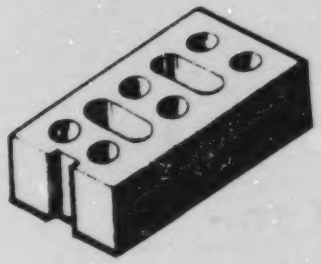


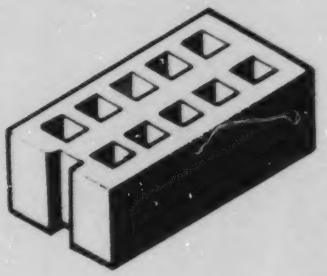
C. Rubble stone

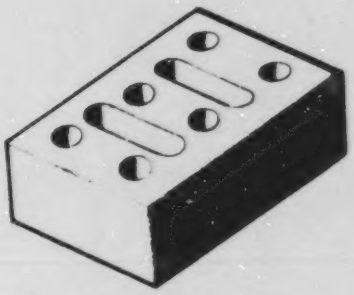
1. Large and irregular in shape
2. Used to build thick, strong walls

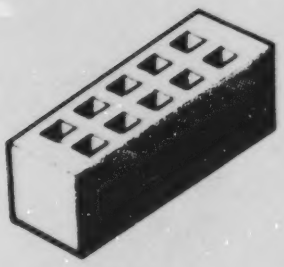


MODULAR BRICK SHAPES









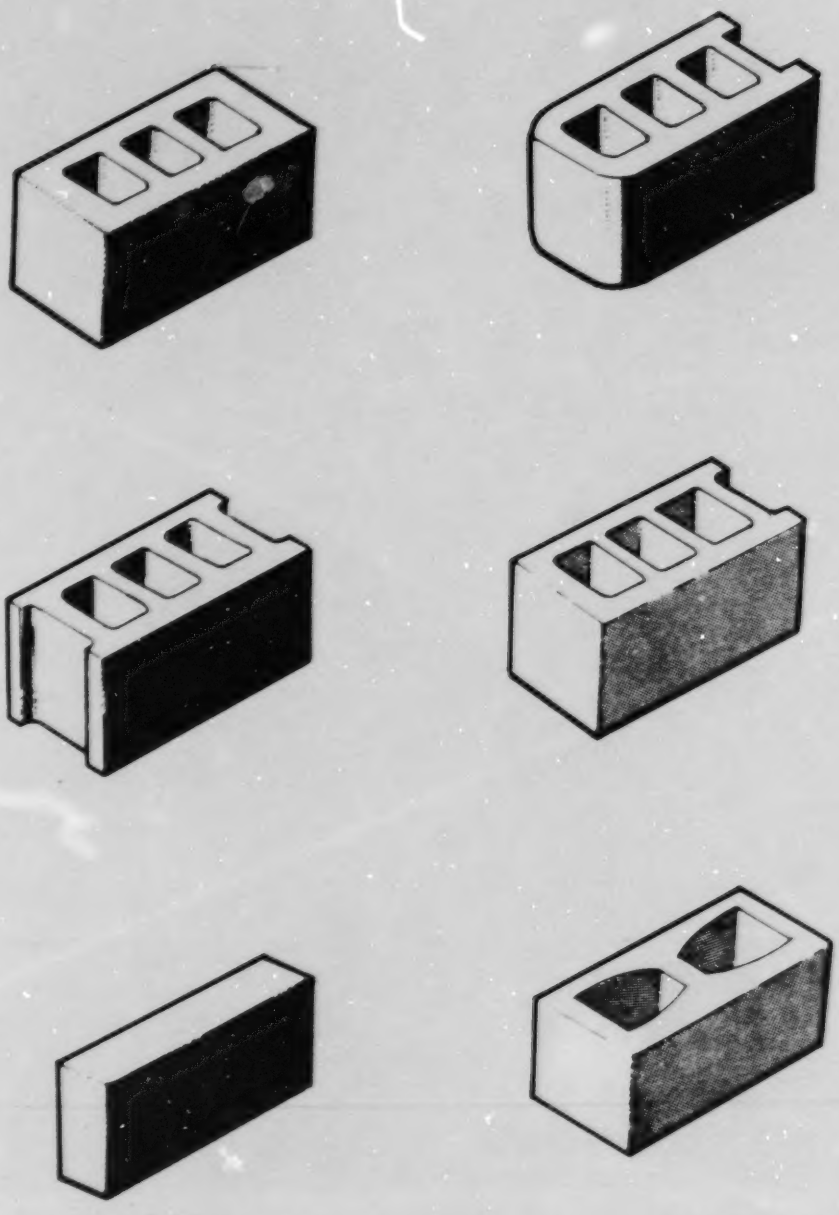
TM-9

MODULAR BRICK SIZES

UNIT DESIGNATION	NOMINAL DIMENSIONS, IN.			JOINT THICKNESS IN.	MANUFACTURED DIMENSIONS IN.		
	t	h	l		t	h	l
STANDARD MODULAR	4	2 2/3	8	3/8	3 5/8	2 1/4	7 5/8
				1/2	3 1/2	2 1/4	7 1/2
ENGINEER	4	3 1/5	8	3/8	3 5/8	2 13/16	7 5/8
				1/2	3 1/2	2 11/16	7 1/2
JUMBO	4	4	8	3/8	3 5/8	3 5/8	7 5/8
				1/2	3 1/2	3 1/2	7 1/2
DOUBLE	4	5 1/3	8	3/8	3 5/8	4 15/16	7 5/8
				1/2	3 1/2	4 13/16	7 1/2
ROMAN	4	2	12	3/8	3 5/8	1 5/8	11 5/8
				1/2	3 1/2	1 1/2	11 1/2
NORMAN	4	2 2/3	12	3/8	3 5/8	2 1/4	11 5/8
				1/2	3 1/2	2 1/4	11 1/2
NORWEGIAN	4	3 1/5	12	3/8	3 5/8	2 13/16	11 5/8
				1/2	3 1/2	2 11/16	11 1/2
TRIPLE	4	5 1/3	12	3/8	3 5/8	4 15/16	11 5/8
				1/2	3 1/2	4 13/16	11 1/2
SCR BRICK	6	2 2/3	12	3/8	5 5/8	2 1/4	11 5/8
				1/2	5 1/2	2 1/4	11 1/2

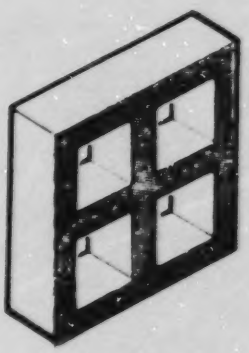
TM-10

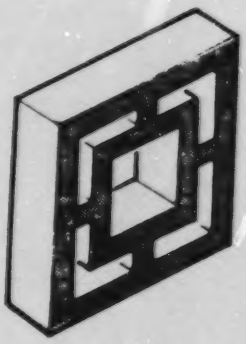
TYPES OF CONCRETE BLOCKS

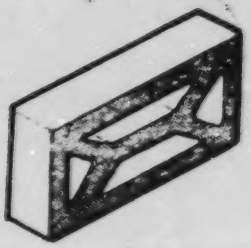


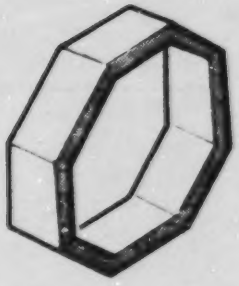
TM-11

DESIGNER CORE BLOCKS









TM-12

ASSIGNMENT SHEET 6--SURVEY OF MASONRY MATERIALS

Directions: Survey the classroom or school. On a sheet of paper, list all the different types of masonry materials you can identify. Try to determine in what class each material would be listed. Below is an example of how your list might appear.

Classroom:	Exterior	Interior
North wall -	Common brick	Standard block Hollow load bearing
East wall -	Common brick	Standard block Hollow load bearing
South wall -	Standard block Nonload bearing	Standard block Nonload bearing
West wall -	Standard block Nonload bearing	Standard block Nonload bearing

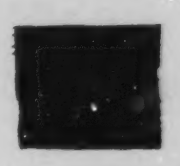
BRICKLAYER'S HELPER

ASSIGNMENT SHEET 7--IDENTIFY MASONRY MATERIALS

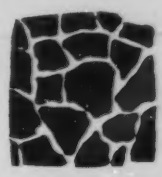
Directions: Identify the type of masonry materials shown below. Choose your answer from the following list:

Flagstone	Brick
Concrete block	Cut stone
Rubble stone	Designer block

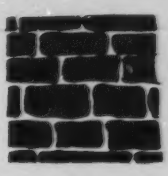
A. _____



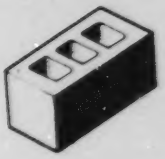
B. _____



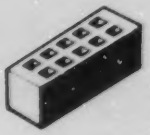
C. _____



D. _____



E. _____



F. _____

BRICKLAYER'S HELPER

INFORMATION SHEET 5--MORTAR PREPARATION

I. Terms and definitions

A. Mortar--a mixture of portland cement, lime, sand, and water used for bonding brick

B. Caustic--any material, such as acid, that can cause burns by chemical reaction

C. Lime--a caustic material used in making mortar mix

D. Masonry cement--pre-mixed portland cement and lime used in making mortar

E. Plastic mortar--mortar that has just been mixed

F. Slump--the settling action of plastic mortar

G. Above grade--above the level of the ground (TM-13)

H. Below grade--below the level of the ground (TM-13)

I. Pre-mix--two or more ingredients mixed and packaged by the manufacturer

J. Bond--to hold together

K. Compress--to push together

L. Consistency--how firm or watery the mortar is

II. Types of mortar mix

A. Pre-mixed

1. Consists of portland cement and lime in correct ratio

2. Needs only sand and water added to become mortar

B. On-the-job

1. Type M

a. Has high compressive strength

b. Used for exterior and below grade work

2. Type S

a. Has high bonding strength

b. Used for exterior and below grade work

3. Type N

a. Used for general purpose

INFORMATION

b. Highly weather resistant

c. For above-grade use only

4. Type O

a. Has low strength

b. Used for interior work only

5. Type K

a. Has very low strength

b. Used for interior work only

c. Will not support a load

III. Considerations for preparing mortar

A. Mortar materials

1. Sand

a. Cleanliness

(1) Should be free of trash, dirt, and rocks

(2) Will not bond if dirty

b. Sharpness

(1) Must be sharp-edged to bond

(2) Will slump and not bond if round

MAGNIFIED VIEW OF SAND

c. Sized

(1) Should have different sizes of sand mixed together

(2) Small sizes fill in between larger sizes

2. Water

a. Must be clean

b. Will make weak mortar if dirty

B. Mortar mix formulas

1. Pre-mixed

a. One part mortar mix,

b. Three parts sand, and

c. Water

2. On-the-job mix

PARTS BY VOLUME			
Type	Portland Cement	Hydrated Lime	Sand
M	1	1/4	2 1/2 to 3 times the total amount of cement and lime
S	1	1/4 to 1/2	
N	1	1/2 to 1 1/4	
O	1	1 1/4 to 1 1/2	
K	1	2 1/2 to 4	

C. Methods of mixing mortar

1. Determine correct amount of mortar mix, lime, and sand that the bricklayer wants.

2. Prepare the mortar mix by hand.

a. Place half of sand needed in a clean, dry mortar box.

b. Place mortar mix on the sand.

c. Place the remaining sand on top of the mortar mix.

d. Mix the sand and mortar well, using the mortar hoe.

e. Move all of the mixture to one end of the box, using the mortar hoe.

f. Add water to the empty end of the box.

g. Mix the dry mixture into the water.

(NOTE: This mixing may be called "cut" because of the chopping action used.)

h. Add water while mixing until mortar is the proper consistency.

i. Let mortar stand for 5 minutes.

j. Mix again.

(NOTE: To test for proper consistency, drag the tip of the trowel through the mortar. The "V" formed by the trowell should not slump, and the mortar surface should be smooth.)

3. Prepare mortar mix with the power mixer.

   a. Pour small amount of water into the mixer.

   b. Start the mixer motor.

   c. Add 1/3 of sand needed.

   d. Slowly add all of the mortar mix.

   e. Add one or two shovels of sand and then a little more water.

   f. Continue step "e" until all of the correct amount of sand is in the mixer.

   g. Add water until mortar is of proper consistency.

      (NOTE: Bricklayer will want to check for consistency of mortar at this point.)

   h. Dump mortar from mixer.

D. Caring for mixed mortar

   1. Keep mortar in a tight pile.

   2. Sprinkle lightly with water in very hot weather.

   3. Re-mix every 5 to 10 minutes to keep proper consistency.

   4. Add water only when really necessary.

   5. Wet mortar boards to keep board from drawing water from mortar.

E. Procedures for supplying a mortar stand

   1. Re-mix the mortar in box with mortar hoe.

   2. Wet the inside of wheelbarrow and dump excess water.

   3. Fill the wheelbarrow 3/4 full of mortar, using the shovel.

   4. Push wheelbarrow to mortar stand location.

   5. Wet the surface of the mortar stand.

   6. Place 3 to 4 shovels of mortar onto the center of mortar stand.

   7. Mound the mortar in the center of the stand, using the trowel.

   8. When mason uses mortar down to about one shovel, more mortar should be added to mortar board.

   9. Mix fresh mortar with mortar still on the stand, using the trowel.

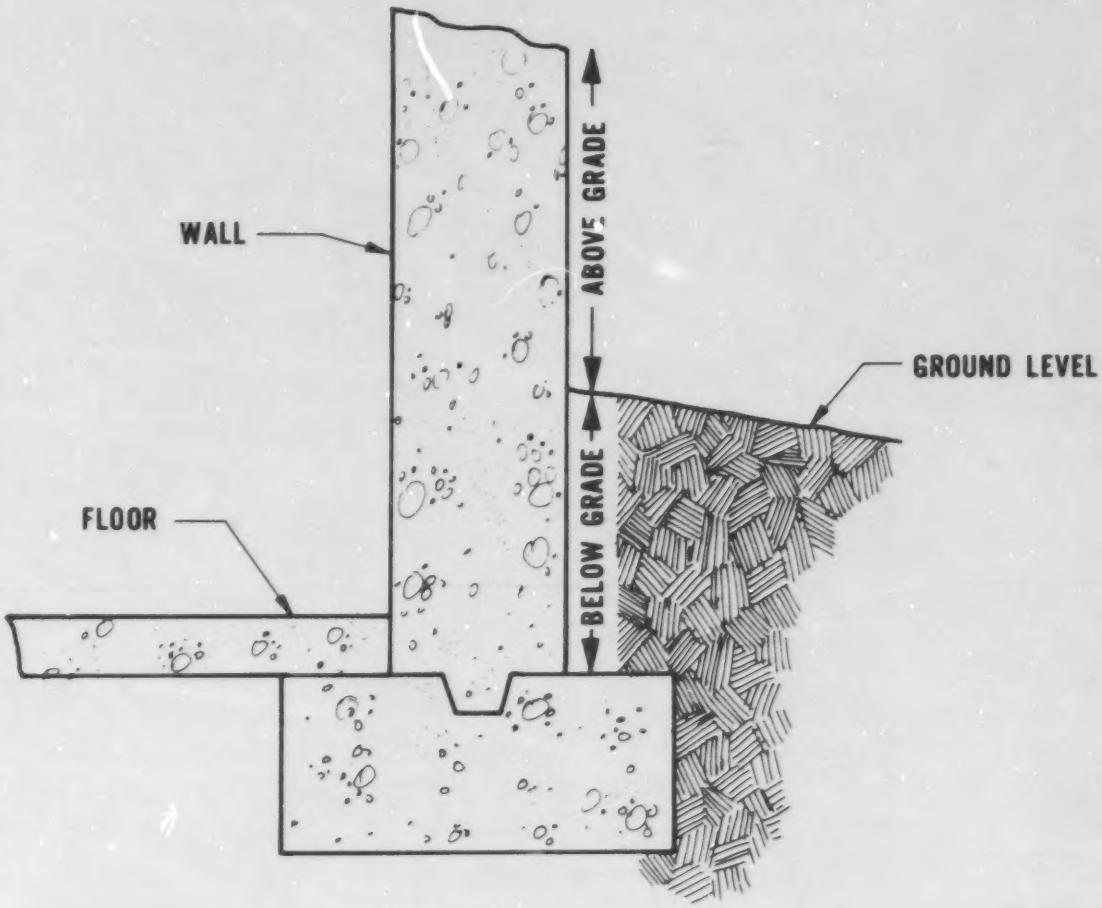
      (NOTE: Keep stand close to the mason but do not get in the way.)

F. Clean tools and equipment

1. Fill mixer 1/4 full of water.
2. Turn on mixer and run it until paddles are clean.
3. Dump the water into proper container.
4. Rinse inside of mixer with water, using hoe.
5. Rinse mortar from all tools.
6. Store tools and equipment properly.

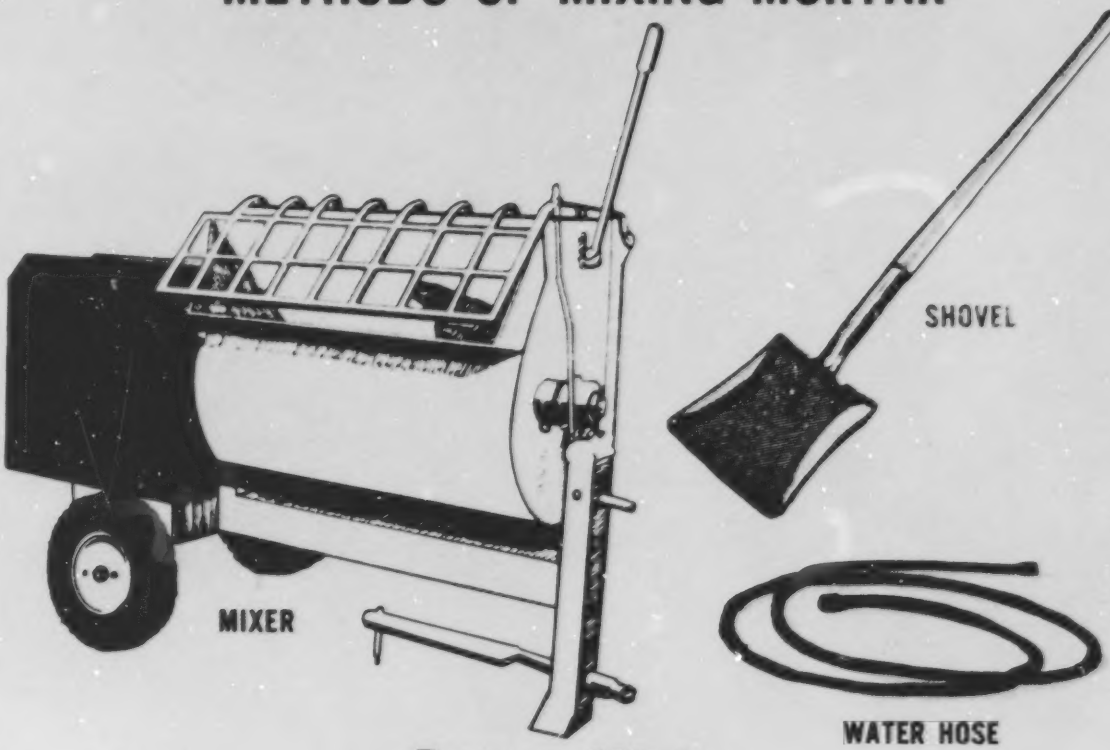
INFORMATION

ABOVE GRADE–BELOW GRADE



TM-13

METHODS OF MIXING MORTAR



Power Mixing

Hand Mixing

TM-14

BRICKLAYER'S HELPER

ASSIGNMENT SHEET 8--MORTAR PREPARATION

1. List the steps to prepare mortar mix by hand.

2. Fill in the blanks in the mortar mix table.

Type	Portland Cement	Hydrated Lime	Sand
M			
S			
N			
O			
K			

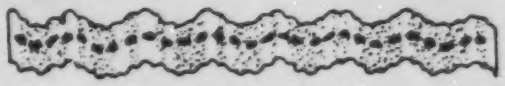
ASSIGNMENT

BRICKLAYER'S HELPER

INFORMATION SHEET 6--WALL CONSTRUCTION

I. Terms and definitions

A. Wall ties--metal strips used to hold a brick wall in place



B. Lead--the first part that is built in a masonry wall

C. Corner lead--building the corners of masonry walls first

D. Closure brick--the last brick laid in a course

E. Course--a layer of bricks, blocks, or stones in a masonry wall

F. Lintel--a support for courses above wall openings

G. Frieze board--a board that is used for trim along the top of the last course

H. Corner pole--any type of post which is propped and braced in a plumb position so a line can be fastened to it

II. Types of masonry joints

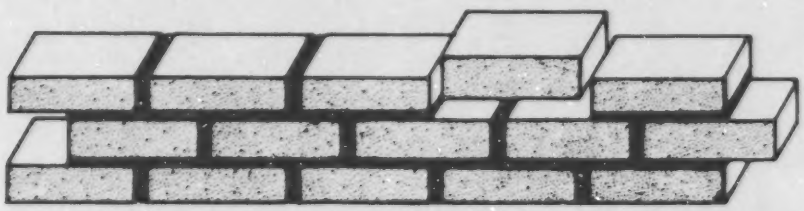
A. Bed joint--The horizontal mortar joint between each course

(NOTE: To prevent mortar from being pressed out of bottom joints, brick masons do not lay more than 10 courses in a wall before mortar has began to harden.)

B. Head joint--The vertical mortar joint between the ends of each brick or block

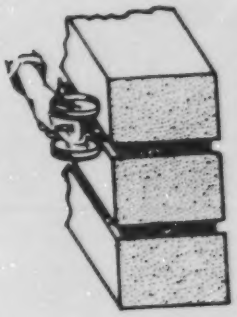
C. Closure joint--The mortar joint between the last brick laid in a course

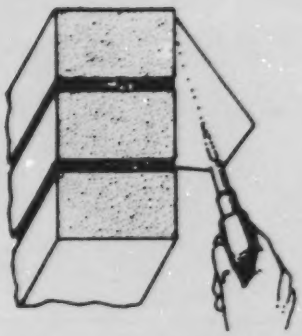
(NOTE: Brick masons check the last brick to be laid in a course for fit before applying mortar to closure joint.)



III. Types of masonry joint finishes

A. Flush--Mortar is removed with edge of trowel, leaving joint even with surface of brick.





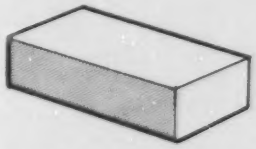
B. Raked--Mortar is raked out of joint to a depth of 3/8 inch using a wheel joint raker.

C. "V"-groove--Mortar is smoothed into joint with either an S-shaped or sled runner tool with "V"-shaped edge.

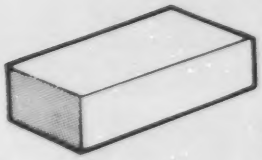
D. Concave--Mortar is smoothed into joint with either an S-shaped or sled runner tool with "U"-shaped edge.

IV. Names of brick positions

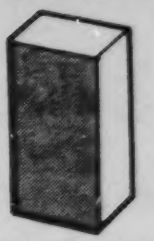
A. Stretcher



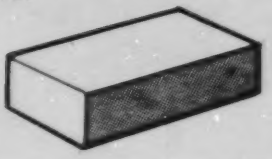
B. Header



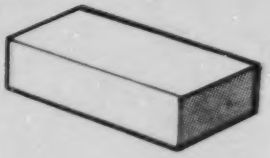
C. Sailor



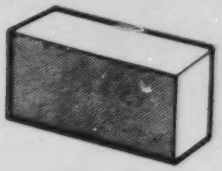
D. Soldier



E. Rowlock



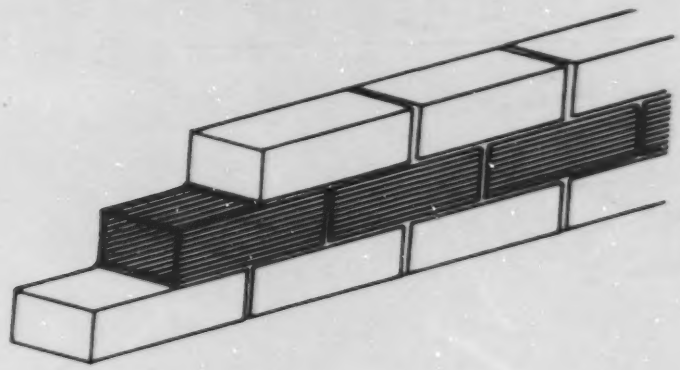
F. Rowlock stretcher



V. Kinds of brick courses

A. Stretcher--the straight running courses in a wall

(NOTE: Stretcher courses are also called bond courses.)



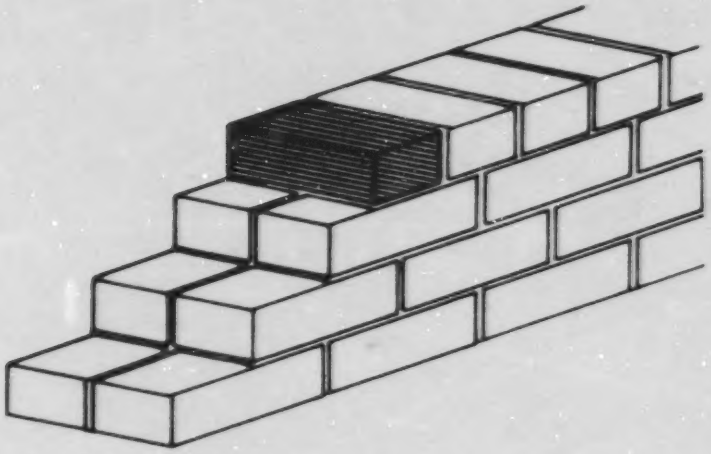
B. Soldier

1. Brick stood on end to finish top of wall

2. Allows for stretcher courses to be laid to the window openings

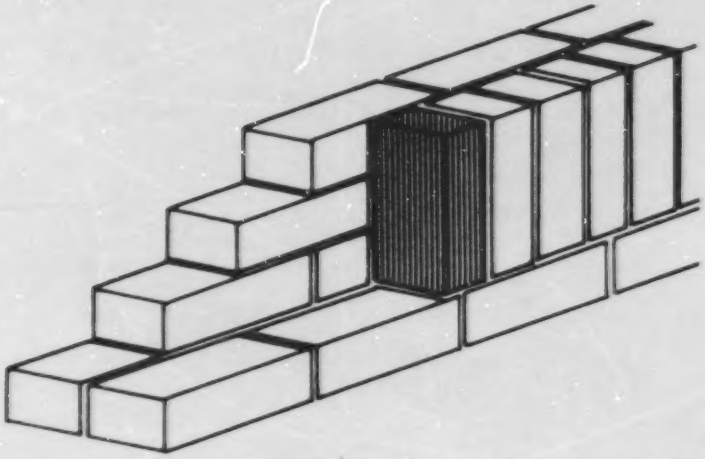
INFORMATION

3. Allows for top courses to be laid to the frieze board



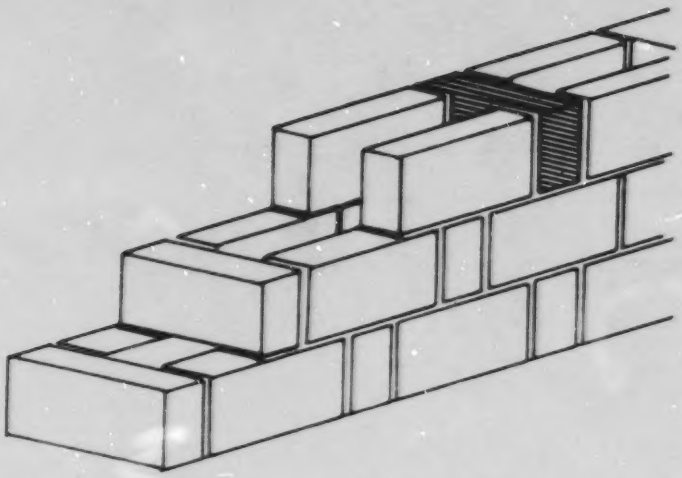
C. Header

1. Courses that are turned crosswise in a double wall
2. Ties double walls together every sixth course
3. Used to cap the top of a double wall



D. Rowlock

1. Bricks are turned on edge
2. Used to cap double walls
3. Used to make window sills



VI. Kinds of brick bonds (TM-15)

A. American

(NOTE: Also known as running bond.)

B. Flemish

C. English

D. Stack

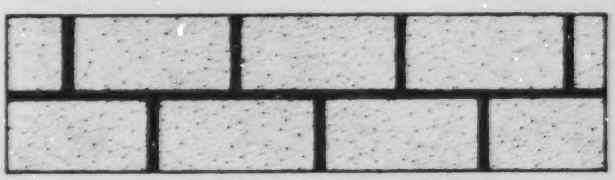
E. Common bond--sixth course headers

VII. Concrete blocks

A. Joints--same as for brick

B. Bonds

1. Straight--should be laid with 1/2 overlap for maximum strength

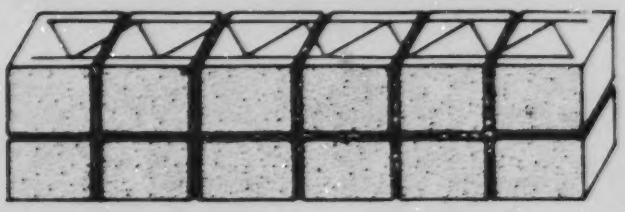


2. Decorative

a. Used for beauty

INFORMATION

b. Must be reinforced every second course



VIII Considerations for laying corner leads (TM-16)

A. Bricklayers usually lay corners first when constructing a masonry wall.

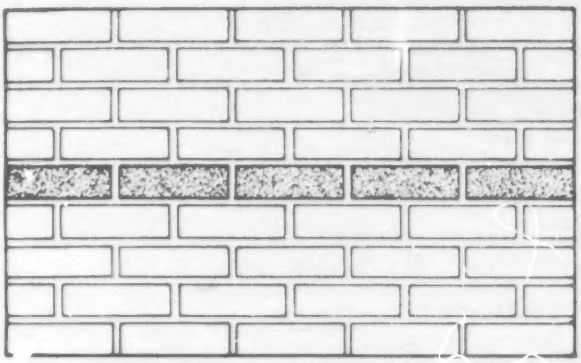
B. They set the corner pole in place and plumb this with the courses marked.

C. Next, they lay the stretcher course, first without mortar, to check the spacing.

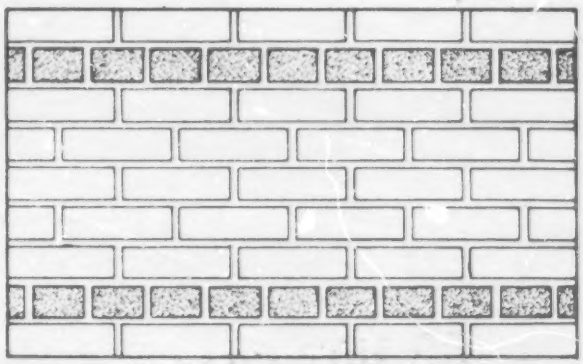
D. The next step is to mortar the corners in place first.

E. They always check for plumb and level as the corner is being laid.

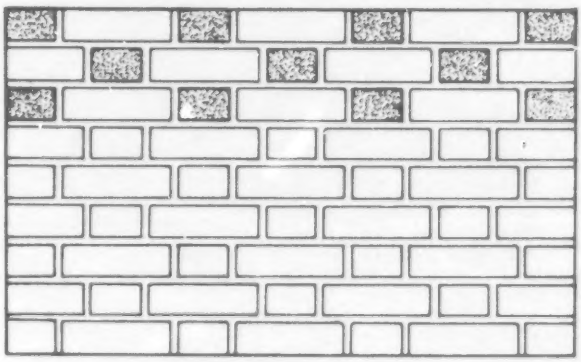
KINDS OF BRICK BONDS



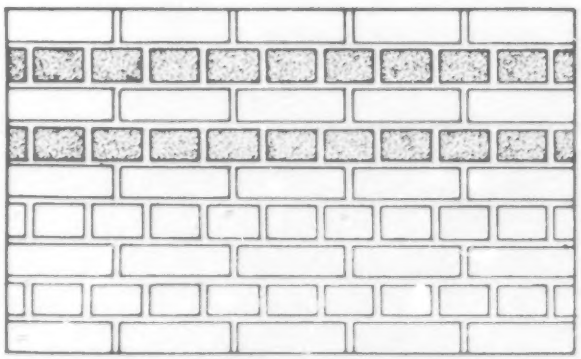
RUNNING BOND OR AMERICAN BOND



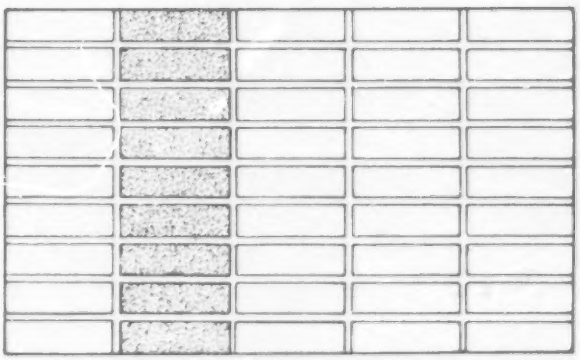
COMMON BOND - 6TH COURSE HEADERS



FLEMISH BOND



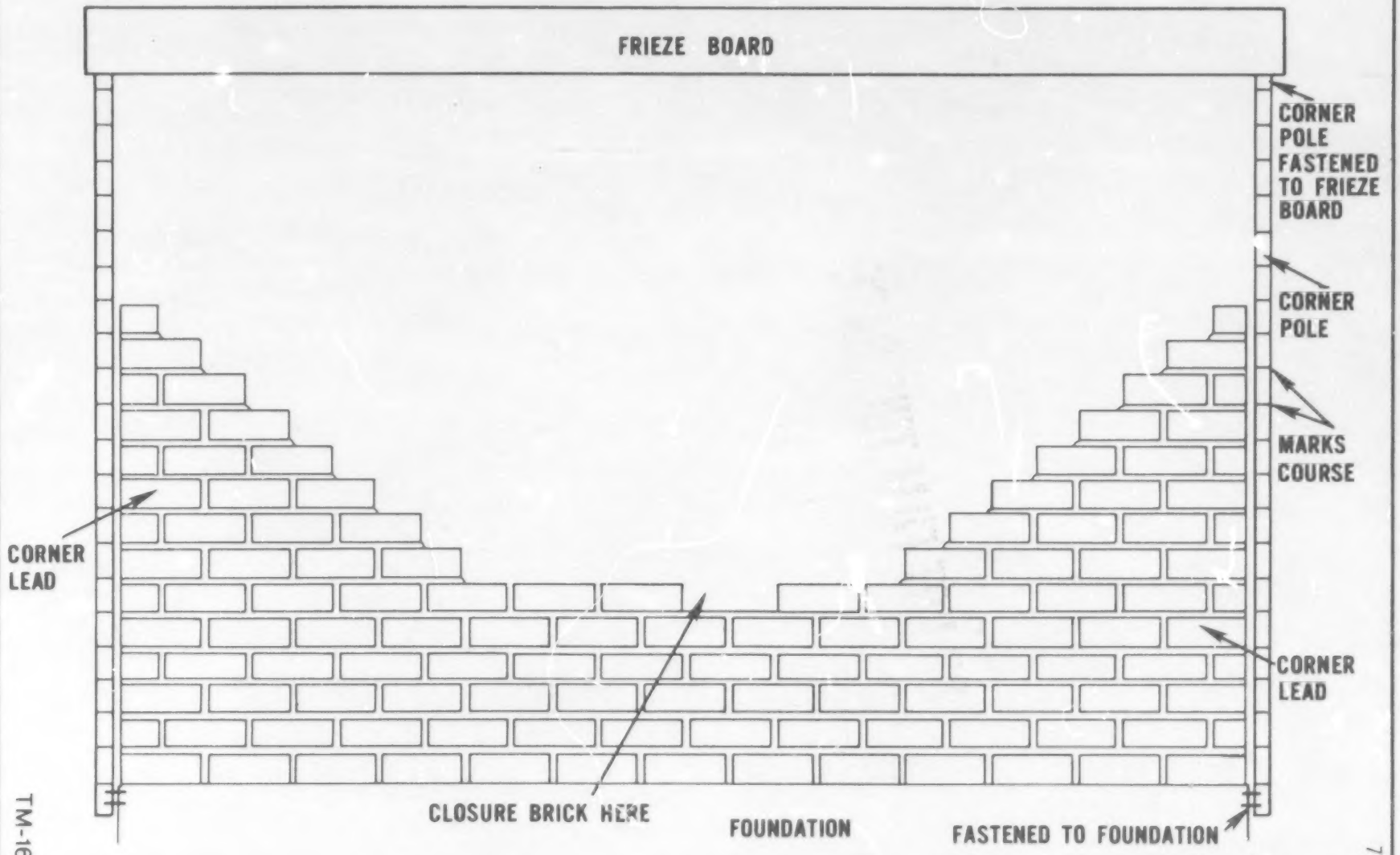
ENGLISH BOND



STACK BOND

TM-15

TYPICAL WALL SECTION



BRICKLAYER'S HELPER

ASSIGNMENT SHEET 9--WALL IDENTIFICATION

Directions: Do a survey of a brick wall. Identify the types of joint finishes, brick positions, kinds of brick courses, and the types of brick bonds. Draw a section of the wall and label each type of joint, brick position, brick course, and brick bond. If you need to, use a picture of a brick wall.

ASSIGNMENT

BRICKLAYER'S HELPER

INFORMATION SHEET 7--CLEANUP

I. Terms and Definitions

A. Cleaning Agent--a solution used to remove mortar or stains from masonry

B. Hydrochloric acid--an acid that, when combined with water, makes muriatic acid which is used to clean mortar from masonry

C. Proprietary cleaning agent--a product made by a company which is used to clean masonry; usually sold under specific trade names

II. Cleaning New Masonry

A. Preventing need for cleaning

1. Proper storage of brick or block at the job site will help prevent dirt or stains.

2. Care in laying brick or block will cause clean-up to be less.

a. Keep mortar pans and boards two feet from the wall to prevent splash.

b. Maintain proper consistency of the mortar to aid in keeping the brick clean.

c. Turn scaffold boards on edge to prevent splatter due to rain during a job.

B. Cleaning agents

1. Muriatic acid--a solution of hydrochloric acid and water; the most common cleaning agent

2. Proprietary cleaning compound--Many different commercial cleaning agents are available for specific cleaning.

(NOTE: Always follow directions on the label!)

C. Tools and Equipment

1. Proper Clothing

(NOTE: Due to the nature of the work, a hard hat, rubber apron or pants, rubber boots, and rubber gloves should be worn.)

a. Hard hat--to protect from falling objects

b. Rubber apron--protects clothes from the acid solution

c. Rubber boots--used to keep feet dry

d. Rubber gloves--gloves with long cuffs to protect the arms

2. Tools

   a. Steel scraper--a rigid scraper used to scrape mortar from the wall

   b. Stiff bristle brush--a nonmetallic brush used to apply acid

   c. Water hose--hose with cutoff nozzle needed to apply water to the work

   d. Bucket--a nonmetallic bucket needed for the acid solution; a metallic container should not be used for acid solutions

   e. Ladder--used to obtain access to the work for small areas

   f. Scaffolding--for large areas a well-built scaffold makes work easier and safer

D. Cleaning Procedures--New Masonry

1. The cleaning operation should be one of the last phases of a job. Do not begin until mortar has set and cured.

2. Dry clean the area. Remove large pieces of mortar with the scraper or wire brush.

3. Presoak the area to remove loose mortar and dirt. Wet the area completely to prevent the acid from being drawn into the surface of the brick.

4. Prepare the acid. Follow directions on the label and use a nonmetallic container.

   a. Dark brick--use a mix of not more than one part acid to nine parts water.

   b. Light brick--use a mix of not more than one part acid to fifteen parts water.

   (DANGER: Always pour acid into water.)

5. Apply the acid solution and scrub the area with the stiff bristle brush.

6. Keep the area wet. Do not let the cleaned area or surrounding areas dry before being flushed with clean water.

7. Scrub the area to be cleaned with the brush. Stubborn areas may require a piece of brick used as a scraper to remove mortar. Clean the brick, not the mortar joints.

8. Clean small areas at a time to prevent the cleaning solution from drying out and depositing the cleaning solution on the face of the brick.

9. Acid solution loses its strength after 5 to 10 minutes of contact with mortar.

10. Acid and dissolved mortar must be flushed from the cleaned area to prevent stains.

INFORMATION

BRICKLAYER'S HELPER

ASSIGNMENT SHEET 10--CLEANING MASONRY

I. Directions: Match the correct terms listed below to the correct definitions.

A. Proprietary cleaning agent
B. Hydrochloric acid
C. Cleaning agent
D. Muriatic acid

1. _____ a solution used to remove mortar or stains from masonry

2. _____ an acid that, when combined with water, makes muriatic acid which is used to clean mortar from masonry

3. _____ a product made by a company which is used to clean masonry; usually sold under specific trade names

II. List the steps used to clean a new masonry wall:

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

BRICKLAYER'S HELPER

INFORMATION SHEET 8--CLEANING BLOCK

I. Terms and Definitions

Concrete Block--a solid or hollow masonry unit made of concrete

II. Cleaning Procedures

A. Block joints should be brushed immediately after they are painted.

B. Care in laying block is the best cleaning process.

C. Acid should not be used to clean block.

D. Mechanical means such as a scraper, chisel, wire brush should be used.

E. A piece of brick or block should be used to sand or rub the block.

F. Paint can be removed with paint removers.

(NOTE: Always do a small sample to test for color changes, etc.)

G. Experiment using different brick and block pieces to rub off mortar.

H. Use commercial paint removers on block to test effectiveness before using on large areas.

I. Consideration may be given to painting the complete unit to cover up the stain.

BRICKLAYER'S HELPER

INFORMATION SHEET 9--MORTAR JOINT REPAIR

I. Terms and Definitions

A. Cracks--usually occur at mortar joints; may be caused by accident or foundation settling or expansion

B. Mortar joint--the space filled with mortar between each brick

C. Tuck pointing--putting fresh mortar into defective joints

II. Motar Joint Repairs

A. It is common to find cracks or joints across brick. The cracks can easily be repaired to prevent water from entering behind the masonry. Cracks could be caused by:

1. Improper mortar mix

2. Failure of expansion seams

3. Accident

4. Settling of building

5. Expansion caused by heating and cooling

B. For effective repair, old mortar must be removed.

1. A wide chisel is used to break up the mortar.

2. Some areas will require a small cape chisel to remove mortar.

3. Clean the joint with a mortar rake or pointed piece of steel.

C. Mix repair mortar

1. Use 1 part mortar mix to 2 1/2 parts sand.

2. Add water to make a pasty mixture.

D. Wet the joint to be repaired.

E. Apply the mortar to the joint to be repaired.

1. A tuck pointer tool is helpful.

(NOTE: Tuck pointer--a narrow short trowel used for repair.)

2. Use only small amounts of mortar until the joint is filled.

3. Finish the joint to blend with the rest of the wall.

4. Brush off excess mortar before it dries.

5. Keep area moist until mortar sets.

BRICKLAYER'S HELPER

TEST PART 1

A. Match the terms to their definitions by placing the correct letter in the space at the left.

_____ 1.	Skilled workers who build walls, partitions, fireplaces	a. Bricklayer's helper
_____ 2.	Masonry workers who set or lay tile	b. Tile setter
_____ 3.	Mason tender	c. Stonemason
_____ 4.	Masonry workers who lay stone	d. Bond
_____ 5.	The tying together of a masonry wall	e. Bricklayer

B. Answer the following statements true or false by placing a T for true or an F for false in the space provided.

_____ 1. Bricklayers' helpers must be in good physical condition.

_____ 2. Work for a bricklayer is often determined by weather conditions.

_____ 3. Helpers get to sit and watch the bricklayer while he/she works.

_____ 4. Bricklayers' helpers are sometimes called mason tenders.

_____ 5. Helpers may learn the trade and move into apprenticeship programs.

_____ 6. Stonemasons lay stone rather than brick.

_____ 7. Hod carriers carry heavy hods up and down hills.

_____ 8. Paving is forming a floor with brick, stone, or tile.

_____ 9. A bearing wall supports a load other than its own weight.

_____10. Glazed tile has a glasslike or slick surface.

BRICKLAYER'S HELPER

TEST PART 2

A. Select the correct safety rules by circling the letter in front of the words that best completes each phrase below.

1. A trowel should be used carefully because of:

   a. sharp edges

   b. germs

   c. weight

2. Brick hammers are made of hardened steel and can:

   a. be too heavy to lift

   b. shatter if struck against other hardened surfaces

   c. cause strained muscles if used for long periods of time

3. Mortar stands should be placed:

   a. within easy reach

   b. at a safe distance from the house

   c. at shoulder level

4. Scaffolds should be built with:

   a. light boards so they can easily be moved

   b. scrap lumber to prevent waste

   c. materials strong enough to support the worker, mortar, and bricks

5. Wheelbarrows should be used to:

   a. push your friends around

   b. lift light loads

   c. move heavy loads

6. The correct personal safety equipment that should be worn in masonry occupations is:

   a. rain coats and rubber boots

   b. hard hats, steel-toed shoes, and safety glasses

   c. casual slacks with shined shoes

7. Gasoline engine tanks should always be:

   a. filled while in an open area

   b. cleaned occasionally with gasoline

   c. started with the gas cap off

B. Complete the following statements by filling the blanks.

1. One should avoid _____ power equipment.

   a. the use of

   b. touching moving parts on

   c. checking the oil on

2. Worksites have many dangerous situations such as _____.

   a. moving equipment

   b. falling airplanes

   c. your mother to take care of you

BRICKLAYER'S HELPER

TEST PART 3

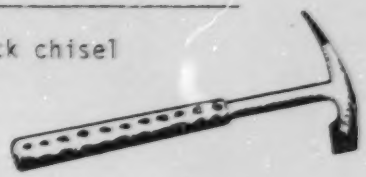
A. Identify the following masonry hand tools as either a "laying tool" or "finishing tool" by writing either the word "laying" or "finishing" in the blank above each tool.

1. _____

Trowel

2. _____

Brick chisel

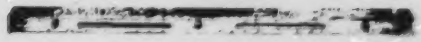


3. _____

Brick hammer

4. _____

Mason's level



5. _____

Joint raker

6. _____

Tuck pointer joint filler

7. _____

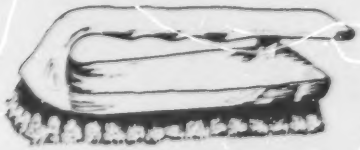
Mortar hoe

8. _____

Shovel

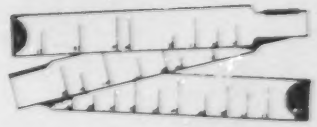
9. _____

Mason's utility brush



10. _____

Spacing rule

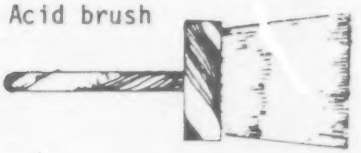


11. _____

Brick brush

12. _____

Acid brush



B. Select the items below that are masonry equipment by placing a " " in the blank.

_____ 1. Mortar box

_____ 2. Wooden wheelbarrow

_____ 3. Brick tongs

_____ 4. Jack plane

_____ 5. Scaffolds

_____ 6. Mason's line

_____ 7. Rubber gloves

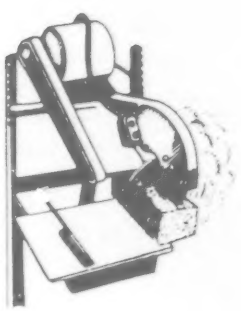
_____ 8. Corner blocks

_____ 9. Crosscut saw

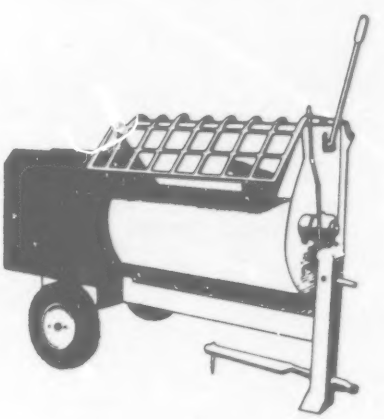
_____10. Corner poles

C. Identify the masonry power equipment below.

1. _____



2. _____



TEST PART 4

A. Match the masonry terms to their definitions by placing the correct letter in the space at the left.

_____a.	The actual size of a brick plus the thickness of the mortar joint	1. Ceramic
_____b.	A large oven used to burn or "fire" bricks	2. Brick
_____c.	A solid or hollow masonry unit made of concrete	3. Kiln
_____d.	A high gloss finish that is baked in a kiln	4. Nominal
_____e.	A masonry unit made of clay or shale and fired in a kiln	5. Modular
_____f.	Brick sizes that make estimating the number of bricks needed easier	6. Concrete block

B. List three types of bricks used in masonry construction.

1.

2.

3.

C. Identify the characteristics of concrete blocks by placing a "✓" in the blank in front of each correct statement.

_____1. Designer core blocks are used for decorative walls and to control noise and light.

_____2. Glazed face blocks have ceramic surfaces that resist water and chemicals.

_____3. Solid load-bearing blocks are not more than 40% hollow in a cross-sectional area.

_____4. Hollow nonload bearing blocks are thin and lightweight.

_____5. Thickness of concrete block can vary from 4 to 12 inches.

D. List three kinds of stone used in masonry construction.

1.

2.

3.

BRICKLAYER'S HELPER

TEST PART 5

A. Match the terms associated with mortar preparation to the correct definition by placing the number of each term on the right in the blanks on the left.

_____a.	Pre-mixed portland cement and lime used in making mortar	1.	Plastic mortar
_____b.	Mortar that has just been mixed	2.	Above grade
_____c.	Above the level of the ground	3.	Pre-mix
_____d.	Below the level of the ground	4.	Masonry cement
_____e.	Two or more ingredients mixed and packaged by the manufacturer	5.	Bond
_____f.	To hold together	6.	Below grade
_____g.	To push together	7.	Consistency
_____h.	How firm or watery the mortar is	8.	Compressive
_____i.	The setting action of plastic mortar	9.	Slump

B. Identify the correct types of mortar mix below. Place a "√" in the blank beside each of the correct types.

_____1. Type M

_____2. Type S

_____3. Type E

_____4. Type O

_____5. Type N

_____6. Type K

C. Point out the things that the worker should consider when mixing mortar by placing a "√" in front of each listed below:

_____1. The cleanliness of the sand

_____2. The weight of the sand

_____3. The cleanliness of the water

_____4. The ratio for mixing the mortar materials

_____5. The method used for mixing

_____6. The height of the power mixer

_____7. The moisture content of the mix

_____8. The effect of hot weather on the mortar mix

TEST PART 6

A. Match the terms associated with wall construction to the correct definition by placing the number of each term in the blank.

_____a.	Building the corners of masonry walls first	1. Closure brick
_____b.	Metal strips used to hold a brick wall in place	2. Lintel
_____c.	The last brick laid in a course	3. Wall ties
_____d.	A board that is used for trim along the top of the last course	4. Frieze board
_____e.	A support for courses above wall openings	5. Course
_____f.	A layer of bricks, blocks, or stones in a masonry wall	6. Corner lead

B. List three types of masonry joints.

1.

2.

3.

C. Select the correct types of masonry joint finishes below. Place a "✓" in the blank beside the correct types.

_____1. Flush

_____2. Concave

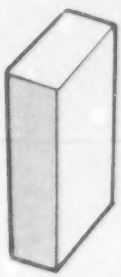
_____3. "A" groove

_____4. "V" groove

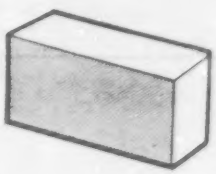
_____5. Raked

D. Identify the brick positions. Select the correct name for each from the list below and write it in the blank.

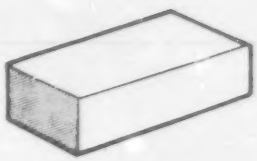
Stretcher
Header
Soldier
Sailor
Rowlock
Rowlock stretcher



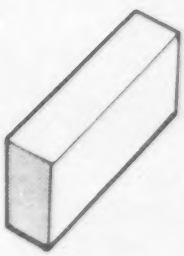
1. _____



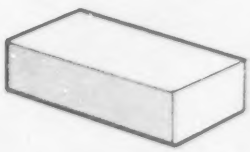
2. _____



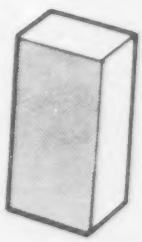
3. _____



4. _____



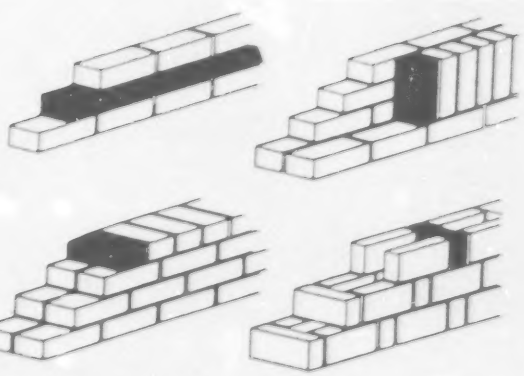
5. _____



6. _____

E. Identify the kinds of brick courses below. Place a "/" in the blank beside the correct kinds.

_____1. Stretcher
_____2. Header
_____3. Rowlock
_____4. Mortar bond
_____5. Soldier
_____6. Box row



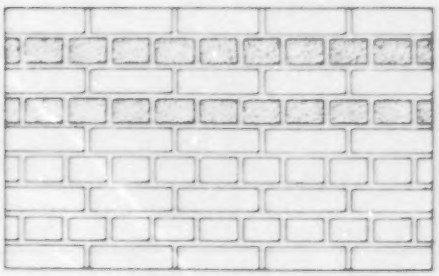
F. Identify the brick bonds. Select the correct name from the list below and write it in the blank.

American

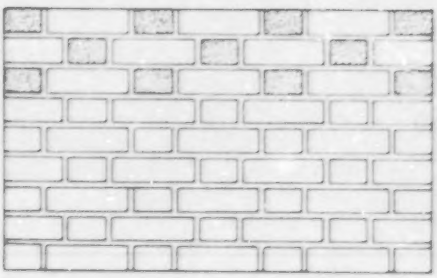
English

Flemish

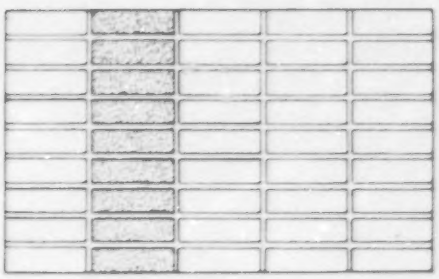
Stack



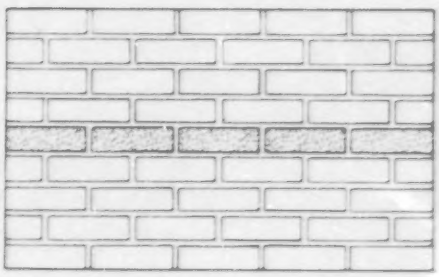
1. _____



2. _____



3. _____



4. _____

G. List two types of concrete block bonds.

1.

2.

H. Point out the things to consider when laying a corner lead by placing a "✓" in front of each.

_____1. The corner pole is plumbed after it is set in place.

_____2. Corners are always laid last.

_____3. The stretcher course is laid without mortar to check spacing.

_____4. Check for plumb and level as corner is laid.

I. Point out the correct considerations for laying a masonry wall by placing a " " in front of each.

_____1. Location of openings must be established.

_____2. Size and height of opening is not important.

_____3. Sheetrock is used for lintels.

TEST

BRICKLAYER'S HELPER

TEST PART 7

A. Match the terms on the right to the correct definition on the left by placing the number in the blank.

_____A.	An acid that, when combined with water, makes muriatic acid	1. Cleaning agent
_____B.	Usually occur at mortar joints, may be caused by accident or foundation settling or expanding	2. Proprietary cleaning agent
_____C.	A straight piece of material such as a 2 x 4 used to level wet concrete	3. Hydrochloric acid
_____D.	A product made by a company which is used to clean masonry	4. Concrete
_____E.	A bonding agent that hardens when mixed with water	5. Cracks
_____F.	A solution used to remove mortar or stains from masonry	6. Tuck pointing
_____G.	A mixture of cement, sand, gravel, and water	7. Cement
_____H.	Putting fresh mortar into defective joints	8. Screed

B. Identify the correct statements about cleaning masonry by writing T for true or F for false in the blank in front of each sentence.

_____1. Muriatic acid is made by combining hydrochloric acid and water.

_____2. Proper storage of masonry at the work site will prevent dirt and stains.

_____3. Scaffold boards should be turned after work to prevent splatter.

_____4. Swim suits should be worn when cleaning brick because you are going to get wet anyway.

_____5. Acid solution loses its strength after 1 or 2 minutes in contact with mortar.

_____6. Acid should <u>not</u> be used to clean block.

_____7. Cleaning agents should be tested on a small area prior to large applications.

_____8. Tuck pointing was discovered by a mason named George Tuck.

_____9. Improperly mixed mortar is a cause of cracks in mortar joints.